

June 21, 1989

Reference No.2471

Ms. Ronda L. Hall  
Environmental Engineer  
Waste Management Division  
Hazardous Waste Permits Section  
Michigan Department of Natural Resources  
P.O. Box 30028  
Ottawa Street Building-South Tower  
Lansing, Michigan  
U.S.A. 48909

ORIGINAL-  
This Document Previously  
Transmitted By Telecopier

Dear Ms. Hall:

Re: Detrex Corporation  
Gold Shield Solvents  
Grand Rapids, Michigan  
MID 020 906 764  
Operating License Application Revision

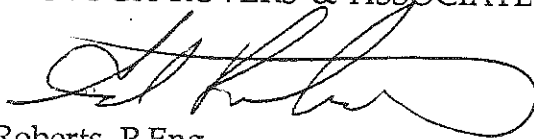
As discussed in the letter dated June 19, 1989 to Ronda Hall (MDNR) from Ed Roberts (CRA), this letter presents a detailed list of insertion instructions for the June 19, 1989 revisions to the operating license application for the above referenced facility.

Also enclosed with this letter, find enclosed 10 copies of Detrex's 1988 Annual Report. As discussed in the attached insertion instructions, the annual report is to be inserted as part of Attachment I-4 to the application.

Should you have any questions, please do not hesitate to contact us.

Yours truly,

CONESTOGA-ROVERS & ASSOCIATES



Ed Roberts, P.Eng.

ER/cdd/5

c.c. C. Guy

RECEIVED

JUN 22 1989

Waste Management  
Division

June 21, 1989  
Reference No. 2471

Insertion Instructions  
for  
June 19, 1989 Revisions to  
Detrex Corporation, Gold Shield Solvents  
Grand Rapids, Michigan  
MID 020 906 764  
Operating License Application

Section A

Replace existing Attachment A-2 with revised Attachment A-2.

Section B

Replace existing pages B-3, B-6, B-7, B-8 and B-9 with new pages B-3, B-6, B-7, B-8 and B-9. Add new page B-11. Replace existing Attachment's B-5 and B-7 with new Attachment's B-5 and B-7. Add new Attachment B-9 which includes legal description and legal plan.

Section C

No revisions

Section D

Replace existing pages D-2, D-3, D-6, D-7, D-8 and D-9 with new pages D-2, D-3, D-6, D-7, D-8, D-9 and D-10. Replace existing Attachment D-1 with new Attachment's D-1a, D-1b, D-1c and D-1d.

Section E

Replace existing Section E with new Section E including Attachment's E-1 through E-5.

Section F

Replace existing Attachment F-1 and F-4 with new Attachment F-1 and F-4.

Section G

Replace existing pages G-3, G-8, G-18 and G-19 with new pages G-3, G-8, G-18 and G-19. Replace existing Attachments G-1, G-2 and G-3 with new Attachments G-1, G-2 and G-3. Add new Attachment G-4.

June 21, 1989  
Reference No. 2471

Section I

Replace existing Attachment I-1 with new Attachment I-1. Replace existing documents, in Attachment I-4 with exception of the 1987 Annual Report, with new documents. Replace 1987 Annual Report with 1988 Annual Report, enclosed.

Section J

Replace existing pages J-6, J-7, J-14, J-15, J-21 and J-22 with new pages J-6, J-7, J-14, J-15, J-21 and J-22.

Section K

Replace existing page K-3, K-8 and K-9 with new pages K-3, K-8, and K-9. Replace existing Attachment K-1a and K-1b with new Attachment K-1a and K-1b. Insert dividers for existing Attachments' K-2 and K-3. Add new Attachment K-4.

June 19, 1989

Reference No.2471

Ms. Ronda L. Hall  
Environmental Engineer  
Waste Management Division  
Hazardous Waste Permits Section  
Michigan Department of Natural Resources  
P.O. Box 30028  
Ottawa Street Building-South Tower  
Lansing, Michigan  
U.S.A. 48909

RECEIVED  
JUN 20 1989  
OFFICE OF RCRA  
Waste Management Division  
U.S. EPA, REGION V

Dear Ms. Hall:

Re: Detrex Corporation  
Operating License Application - Completeness  
Gold Shield Solvents  
Grand Rapids, Michigan  
Deficiencies MID 020 906 764

On behalf of Detrex Corporation, please find enclosed ten (10) copies of revisions to the operating license application for the Gold Shield Solvents Grand Rapids, Michigan facility. The revisions except Comment 1, discussed below, have been incorporated to address completeness deficiencies, as specified in a letter from the MDNR addressed to Detrex Corporation, dated April 18, 1989.

Comment 1

1. General Information [R 299.9508 (1) (a)]
  - A. The operating license application form must be signed by the titleholder of land on which the facility is constructed, Heyboer and Bolt Ceiling & Ceramics, Inc. The signatory must be a responsible corporate officer, or a duly authorized representative, in accordance with 40 C.F.R. §270.11. A certification statement from the titleholder of the land must also be included in the application in accordance with 40 C.F.R. §270.11 (d).

RECEIVED

JUN 20 1989

Waste Management  
Division



June 19, 1989

Reference No. 2471

2

B. Proof of Issuance of All State Environmental Permits  
[R 299.9508 (1) (f)]

The operating license application must provide proof of issuance of all State environmental permits.

Response 1

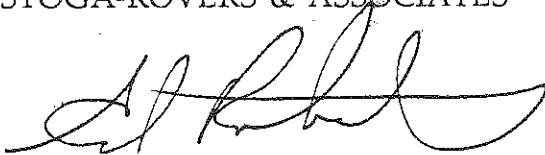
- A. Detrex Corporation has attempted to have the titleholder of land on which the facility is constructed to sign the operating license application form (Form 1 General). The titleholder of the land has refused to sign the form until the titleholder's counsel and Detrex's counsel reach an agreement concerning indemnification and insurance requirements. Detrex's counsel is currently pursuing the titleholder's signature, however, this exercise will require additional time. The signed operating license application form will be forwarded to the MDNR when completed.
- B. Detrex Corporation provides self-insurance by satisfying the financial test (see Section I-8). The Gold Shield Solvents, Grand Rapids facility does not have any other State environmental permits, other than interim status for the container storage area.

I will forward a detailed list of insertion instructions to you by June 21, 1989.

Should you have any questions, please do not hesitate to contact us.

Yours truly,

CONESTOGA-ROVERS & ASSOCIATES



Ed Roberts, P.Eng.

ER/cdd/4

c.c. C. Guy

→ J-E / P.O. Box 5111  
P.O. Box 5111

# DETREX CORPORATION

P.O. Box 5111, Southfield, MI 48086-5111



TELEPHONE:  
(313) 358-5800

TWX 810-224-4756

VIA FEDERAL EXPRESS

November 22, 1989

Ms. Ronda L. Hall  
Environmental Engineer  
Waste Management Division  
Hazardous Waste Permit Section  
Department of Natural Resources  
Ottawa Building South  
P. O. Box 30241  
Lansing, Michigan 48909

RECEIVED  
NOV 27 1989  
Waste Management  
Division

Re: Grand Rapids Gold Shield Facility  
EPA I.D. No. MID 020906764  
312 Ellsworth, S.W.  
Application for Part B Permit

Dear Ms. Hall:

Due to the difficulties and imposed conditions encountered in obtaining the signatures and certifications of the titleholder and the land contract vendee of the property upon which Detrex's Grand Rapids facility is located, we are unfortunately unable to comply with this requirement of the Part B Permit.

Therefore, we would like to withdraw our Part B Permit Application. In its place we would like permission to convert part of the facility to a transfer station for chlorinated solvents as well as flammables. These wastes will be stored in a trailer and transferred to proper disposal in less than 10 days as required by law.

We are presently preparing a drawing converting the depressed driveway inside the building to a transfer station, which will be submitted to the proper authorities for approval.

We also assume that withdrawal of the Part B Permit would not impair our continuation in handling virgin solvents in this facility.

Thank you for your cooperation in this matter.

Very truly yours,

I. H. Shamiyeh  
Risk Management Director

OFFICE OF RCRA  
Waste Management Division  
U.S. EPA, REGION 1

RECEIVED  
DEC 1 1989

IHS/smb

cc: D. A. Donnell, Esq. - Mika, Meyers, Beckett & Jones  
B. Monteith - Conestoga-Rovers & Associates, Ltd.

STATE OF MICHIGAN



JAMES J. BLANCHARD, Governor

DEPARTMENT OF NATURAL RESOURCES

STEVENS T. MASON BUILDING  
BOX 30028  
LANSING, MI 48909

GORDON E. GUYER, Director

NATURAL RESOURCES COMMISSION  
THOMAS J. ANDERSON  
ARLENE J. FLUHARTY  
JERRY KAMMER  
O. STEWART MYERS  
DAVID D. OLSON  
RAYMOND POUPORE

May 6, 1988

CERTIFIED MAIL

Mr. Michael J. Tepatti  
Michigan Region Manager  
Detrex Chemical Industries, Inc.  
312 Ellsworth Avenue, S.W.  
Grand Rapids, Michigan 49503

Dear Mr. Tepatti:

SUBJECT: Detrex Chemical Industries, Inc.  
Act 64 Operating License Application  
MID 020 906 764

In 1984, the Federal Resource Conservation and Recovery Act (RCRA) was amended by the Hazardous and Solid Waste Amendments (HSWA) to require a final decision on all permit applications for hazardous waste storage facilities by November 8, 1992. In order to meet the HSWA permit issuance deadline, the Michigan Department of Natural Resources is hereby formally calling in the Act 64 (1979 PA 64, as amended) operating license application for your hazardous waste tank and container storage facility located at 312 Ellsworth Avenue, S.W., Grand Rapids, Michigan. This call-in is being made pursuant to MAC R 299.9502. As specified in R 299.9502(3)(b), an owner or operator of a storage facility must submit a complete operating license application within 120 days of being requested to do so. As an agent for the U.S. Environmental Protection Agency, the Department is also calling in the HSWA portion of your permit application pursuant to Section 3004(u) of RCRA. The operating license will have a federally issued portion and a state issued portion. This dual permitting results because Michigan has not yet received final authorization for all portions of HSWA.

If you do not intend to continue to operate the facility, you may submit a closure plan in lieu of the requested operating license application. The closure plan must meet the requirements of 40 CFR 264 Subpart G, in accordance with and as adopted by reference in R 299.9601(3) and (8). If you desire to pursue this option, you must submit a complete closure plan no later than September 8, 1988.

The following comments will assist you in satisfying this request:

1. If you intend to submit an operating license application, an application form and a detailed instruction package are enclosed for your use. Instructions for preparing a closure plan may be obtained

Mr. Tepatti

Page 2

May 6, 1988

Portions of the application will be extracted and made enforceable provisions of your license. As such, they must be submitted as complete, free standing documents to allow easy attachment to the license. Each item should be precisely written with specific schedules and commitments. Generalities and discretionary language should be avoided whenever possible. The following items are the primary attachments to the Act 64 license:

- a. Waste analysis plan;
- b. Inspection schedule;
- c. Personnel training program;
- d. Contingency plan;
- e. Closure and post-closure plan (including cost estimates);
- f. Facility plans and specifications;
- g. Procedures for all environmental monitoring carried out at the facility.

2. If applicable, the operating license application must include a corrective action program to achieve compliance with Section 3004(u) of RCRA. The RCRA portion of a hazardous waste permit (that portion addressing HSWA requirements) cannot be issued until the requirements of Section 3004(u) are met. Section 3004(u) requires "corrective action for all releases of hazardous waste or constituents from any solid waste management unit at a treatment, storage or disposal facility seeking a permit under this subtitle." The provisions of HSWA require that decisions on permit applications be made on a rigid time schedule.

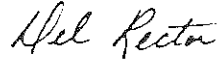
Please submit ten copies of your Act 64 operating license application by September 8, 1988. If you desire to close the facility in lieu of obtaining a permit, please submit a complete closure plan by the date specified previously. The Department recommends that you contact the Hazardous Waste Permits Unit as soon as possible to discuss the requirements outlined in this letter. Failure to submit the requested information within the time period indicated may result in the denial of your applications under Act 64 and RCRA.

Information obtained by the Department through an operating license application is routinely treated as a public record, as provided in the Freedom of Information Act, 1976 PA 442. A record, permit application, or other information, or a portion of a record, permit application, or other information furnished to or obtained by the Department or its agents under Act 64, may be designated confidential, for use only by the Department. If this option is pursued, however, detailed justification for the confidentiality request must be submitted with the Act 64 application. Please submit all confidential material in a sealed envelope marked "confidential material enclosed" and indicate same in your transmittal letter.

Mr. Tepatti  
Page 3  
May 6, 1988

If you have questions, please contact the Hazardous Waste Permits Unit,  
Waste Management Division, at 517-373-2730.

Sincerely,



Gordon E. Guyer  
DIRECTOR  
517-373-2329

cc: Ms. Marilyn Sabadaszka, U.S. EPA  
Mr. Richard Traub, U.S. EPA  
Mr. Alan Howard, DNR  
Mr. John Bohunsky, DNR/District DNR  
Mr. Ken Burda, DNR/Operating License File

# DETREX CHEMICAL INDUSTRIES, INC.



P.O. BOX 501, DETROIT, MICHIGAN 48232

EXECUTIVE OFFICE

TELEPHONE (313) 358-5800

TWX 810-224-4756

November 18, 1980

EPA Region V  
RCRA Activities  
P. O. Box 7861  
Chicago, IL 60680

Gentlemen:

Enclosed is an Application for a Hazardous Waste Permit for  
our facility at:

312 Ellsworth Ave. S. W.  
Grand Rapids, MI 49503

If there are any questions, please contact me.

Very truly yours,

W. G. Robrecht  
Assistant Manager, Corporate Engineering

WGR:ss

Enclosure



November 7, 1988

Reference No. 2471

Ms. Kathleen Clancy  
Environmental Engineer  
Waste Management Division  
Hazardous Waste Permits Section  
Michigan Department of Natural Resources  
Ottawa Street Building - South Tower  
P. O. Box 30028  
Lansing, Michigan  
U.S.A. 48909

RECEIVED

NOV 28 1988

U. S. EPA, REGION V  
SWB - PMS

Dear Ms. Clancy:

Re: Detrex Corporation Gold Shield Solvents  
Act 64 Operating License Application  
MID 020906764

On behalf of Detrex Corporation, please find enclosed ten (10) copies of the Operating License application for the Detrex Corporation Gold Shield Solvents facility located at 312 Ellsworth Avenue in Grand Rapids, Michigan.

Gold Shield Solvents specializes in the sale of halogenated solvents and cleaning equipment and the collection of solvent wastes generated in degreasing and other cleaning operations. The facility operates under EPA Identification Number MID 020906764. The Standard Industrial Classification code (SIC Code) for the facility is 2869.

The hazardous waste operation at the Gold Shield Solvents facility in Grand Rapids Michigan consists of a hazardous waste container storage area within a single enclosed building. The container storage area is used for the storage of drummed solvent wastes prior to the transfer of these wastes to an off-site Detrex solvent reclamation (recycling) facility or an off-site permitted treatment/disposal facility.

The Grand Rapids facility historically operated a hazardous waste recovery (recycling) system consisting of distillation units and generator accumulation tanks. The recycling operation and generated accumulation tanks have been closed. As such, this operating license application is submitted only for the hazardous waste container storage area at Gold Shield Solvents facility.

RECEIVED

NOV 10 1988

Waste Management  
Division

COPY 2

November 7, 1988

2

Reference 2471

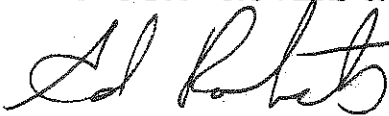
In accordance with Act 64, R 299.9501(c), Detrex Corporation has revised its Part A application from 20,000 gallon design capacity for process code S01 plus 1,900 gallon design capacity for process code S02 to 21,900 gallon design capacity for process code S01.

Also find enclosed the operating license application fee of \$500, made payable to the State of Michigan, pursuant to Act 64, R 299.9508(1)(h).

Should you have any questions or require additional information, do not hesitate to contact Mr. C. U. Guy (Detrex Corporation) at 216-997-6131, or the undersigned, at your convenience.

Yours truly,

CONESTOGA - ROVERS & ASSOCIATES



Ed Roberts, P.Eng.

ER/jve

Encl.

c.c. C. U. Guy, Detrex Corporation (3 copies)  
B.A. Monteith, CRA



## TABLE OF CONTENTS

SECTION A:	ACT 64 OPERATING LICENSE APPLICATION
SECTION B:	FACILITY DESCRIPTION
SECTION C:	WASTE CHARACTERISTICS
SECTION D:	PROCESS INFORMATION
SECTION E:	ENVIRONMENTAL MONITORING PROGRAM
SECTION F:	PROCEDURES TO PREVENT HAZARDS
SECTION G:	CONTINGENCY PLAN
SECTION H:	PERSONNEL TRAINING
SECTION I:	CLOSURE AND POST-CLOSURE PLAN
SECTION J:	ENVIRONMENTAL ASSESSMENT
SECTION K:	CORRECTIVE ACTIONS FOR SOLID WASTE MANAGEMENT UNITS
SECTION L:	OTHER FEDERAL LAWS
SECTION M:	CERTIFICATION

## INTRODUCTION

This Resource Conservation and Recovery Act (RCRA) Part B Permit Application/Act 64 Operating License Application (hereinafter "operating license") is submitted by Detrex Corporation in response to the State of Michigan, Department of Natural Resource's (MDNR's) letter of request dated May 6, 1988.

Detrex Corporation Gold Shield Solvents specializes in the sale of halogenated solvents and cleaning equipment and the collection of solvent wastes generated in degreasing and other cleaning operations. The facility operates under EPA Identification Number MID020906764. The Standard Industrial Classification Code (SIC Code) for the facility is 2869. The facility is located at 312 Ellsworth Avenue, S.W. in Grand Rapids, in Detroit, Michigan and has operated at this location since June 1970.

The hazardous waste operation at the Gold Shield Solvents facility in Grand Rapids, Michigan consists of a hazardous waste container storage area. The container storage area is used for the storage of drummed solvent wastes prior to the transfer of these wastes to an off-site Detrex Solvent reclamation (recycling) facility or to an off-site permitted treatment/disposal facility. As such, this Operating License Application is submitted for the hazardous waste container storage area at the Gold Shield Solvents facility.



Date: 11/08/88  
Revision: 88-0  
Page: A-1

## SECTION A

ACT 64 OPERATING LICENSE APPLICATION

Date: 11/08/88  
Revision: 88-0  
Page: A-2

LIST OF ATTACHMENTS

ATTACHMENT A-1	EPA FORMS 1 AND 3
ATTACHMENT A-2	FACILITY PLAN
ATTACHMENT A-3	FACILITY PHOTOGRAPHS
ATTACHMENT A-4	SURROUNDING AREA TOPOGRAPHIC MAP

Date: 11/08/88  
Revision: 88-0  
Page: A-3

## **SECTION A**

### **ACT 64 OPERATING LICENSE APPLICATION**

The information in this section is supplied in accordance with Michigan Act 64 Rule 299.9504(1) which incorporates 40 CFR§270.13 by reference.

Date: 11/08/88  
Revision: 88-0  
Page: A-4

The following attachments provide the necessary information required.

Attachment A-1 provides the completed EPA Forms 1 and 3.

Attachment A-2 provides a scale drawing of the Gold Shield Solvents facility showing the location of the container storage area within the facility.

Attachment A-3 provides photographs of the facility building and the container storage area.

This facility requires no other permits pursuant to Michigan Act 64 Rule 299.9504(1).

Attachment A-4 presents a topographic map of the facility and the surrounding area. There are no intake or discharge structures, outdoor hazardous waste treatment, storage, or disposal facilities, injection or withdrawal wells, or other wells, springs or surface water bodies within 1/4 mile of the facility.





ATTACHMENT A-1

EPA FORMS 1 AND 3

FORM 4		<b>MICHIGAN DEPARTMENT OF NATURAL RESOURCES</b> (Read the "General Instructions" before starting.)	<b>I. EPA I.D. NUMBER</b> M I D 0 2 0 9 0 6 7 6 4
-----------	---	---	--

APPLICATION FOR HAZARDOUS WASTE  
TREATMENT, STORAGE OR DISPOSAL FACILITY  
CONSTRUCTION PERMIT OR OPERATING LICENSE

NOV 28 1988

U. S. EPA, REGION V

II. CONSTRUCTION PERMIT OR OPERATING LICENSE APPLICATION (check one)

- A. CONSTRUCTION PERMIT APPLICATION  
X B. OPERATING LICENSE APPLICATION

If this is an operating license application, mark an X in the appropriate box:

1. ☐ FIRST APPLICATION (NEW FACILITY)  
2. ☒ FIRST APPLICATION (EXISTING FACILITY)  
3. ☐ RENEWAL APPLICATION  
4. ☐ APPLICATION FOR LICENSE REVISION  
5. ☐ RESEARCH, DEVELOPMENT & DEMONSTRATION LICENSE APPLICATION

III. NAME OF FACILITY

1. SKIP GOLD SHIELD SOLVENTS

IV. FACILITY CONTACT

A. NAME & TITLE (last, first, & title)

B. PHONE (area code & no.)

2. SHARON BURNS

6 1 6

4 5 4

9 2 6 9

V. FACILITY MAILING ADDRESS

A. STREET OR P.O. BOX

3. 312 ELLSWORTH AVE. S.W.

B. CITY OR TOWN

C. STATE

D. ZIP CODE

4. GRAND RAPIDS

MI

4 9 5 0 3

VI. FACILITY LOCATION

A. STREET, ROUTE NO. OR OTHER SPECIFIC IDENTIFIER

5. 312 ELLSWORTH AVE. S.W.

B. COUNTY NAME

KENT

C. CITY OR TOWN

D. STATE

E. ZIP CODE

F. COUNTY CODE  
(if known)

6. GRAND RAPIDS

MI

4 9 5 0 3

VII. TITLEHOLDER OF LAND

8. HEYBOER AND BOLT CEILING & CERAMICS, INC.

A. STREET OR P.O. BOX

5724 CLAY AVE. S.W.

B. CITY OR TOWN

C. STATE

D. ZIP CODE

E. PHONE (area code & no.)

9. GRAND RAPIDS

MI

4 9 5 0 8

A

6 1 6

5 3 1 2 3 3 0

#### WHERE TO SUBMIT THE APPLICATION AND OBTAIN ASSISTANCE

Contact the Waste Management Division, Hazardous Waste Permits Section, at 517-373-2730 to obtain assistance when filing an application. Submit 10 copies of the application to the address given below. Additional copies of construction permit applications will be required if a Site Review Board is convened to consider the proposal.

Michigan Department of Natural Resources  
Waste Management Division  
Hazardous Waste Permits Section  
P.O. Box 30028  
Lansing, Michigan 48909

For Express Mail, use the street address:

608 W. Allegan  
First Floor - South Ottawa Tower

#### Federal Permit Requirements

The State of Michigan is not currently authorized to administer all of the RCRA program. RCRA includes requirements for corrective action that are not included in Act 64. Corrective action provisions are established in the Hazardous and Solid Waste Amendments (HSWA) of 1984, and EPA has incorporated regulations for these provisions. Part 264 Subpart F §§264.90 through 264.109 (see pages 91). Acting as an agent for EPA, the MDNR requests that applicants address corrective action for all releases of hazardous waste or constituents from any solid waste management unit at a treatment, storage or disposal facility seeking a permit in their operating license applications. MDNR will forward a copy of the application to EPA for review and drafting of the HSWA permit. To obtain additional information regarding the requirements of a federal HSWA permit application please refer to the OSWER Directive entitled "RCRA Corrective Action Plan" (#9902) or contact:

Mr. Richard Traub, Chief  
Michigan Permits Unit  
Technical Programs Section  
U.S. EPA - Region 5  
230 South Dearborn Street  
Chicago, Illinois 60604  
(312) 886-6136



CONTINUED FROM THE FRONT

VII. SIC CODES (4-digit, in order of priority)

A. FIRST				B. SECOND			
7	1	6	9	(specify)	7	1	(specify)
C. THIRD				D. FOURTH			
7	1			(specify)	7	1	(specify)

VIII. OPERATOR INFORMATION

A. NAME										B. Is the name listed in Item VIII-A also the owner?	
DETREX CORPORATION										<input checked="" type="checkbox"/> YES <input type="checkbox"/> NO	
C. STATUS OF OPERATOR (Enter the appropriate letter into the answer box; if "Other", specify.)										D. PHONE (area code & no.)	
F = FEDERAL M = PUBLIC (other than federal or state) P = PRIVATE S = STATE O = OTHER (specify) P (specify)										3 1 3 3 5 8 5 8 0 0	
E. STREET OR P.O. BOX											
P O BOX 5111											
F. CITY OR TOWN										G. STATE H. ZIP CODE I. INDIAN LAND	
SOUTHFIELD										MI 4 8 0 8 6	
										Is the facility located on Indian lands? <input type="checkbox"/> YES <input checked="" type="checkbox"/> NO	

OWNERSHIP

A. NAME											
DETREX CORPORATION											
E. STREET OR P.O. BOX											
P O BOX 5111											
F. CITY OR TOWN										G. STATE H. ZIP CODE I. INDIAN LAND	
SOUTHFIELD										MI 4 8 0 8 6	
										3 1 3 3 5 8 5 8 0 0	

X. EXISTING ENVIRONMENTAL PERMITS

A. NPDES (Discharges to Surface Water)										B. PSD (Air Emissions from Proposed Sources)									
9 N										9 P									
C. UIC (Underground Injection of Fluids)										D. OTHER (specify)									
9 U										(specify)									
E. RCRA (Hazardous Wastes)										F. OTHER (specify)									
9 R										(specify)									

XI. MAP

Attach to this application a topographic map of the area extending to at least one mile beyond property boundaries. The map must show the outline of the facility, the location of each of its existing and proposed intake and discharge structures, each of its hazardous waste treatment, storage, or disposal facilities, and each well where it injects fluids underground. Include all springs, rivers and other surface water bodies in the map area. See instructions for precise requirements.

XII. NATURE OF BUSINESS (provide a brief description)

WAREHOUSE & DISTRIBUTION FOR HALOGENATED SOLVENTS

### XIII. FEE INFORMATION (check A or B)

#### A. ☐ CONSTRUCTION PERMIT FEE

1. ☐ COST OF REVIEW

2. ☐ FIXED FEE (complete the following)

FEE

a. Check type of facility:

☐ Land Disposal (\$9,000)

\$ \_\_\_\_\_

☐ Incineration or other treatment (\$7,200)

\$ \_\_\_\_\_

☐ Storage (\$500)

\$ \_\_\_\_\_

b. Site size \_\_\_\_\_ acres (see fee schedule)

\$ \_\_\_\_\_

c. Projected waste volume (see fee schedule)

\_\_\_\_\_ Gallons/day

\$ \_\_\_\_\_

OR \_\_\_\_\_ Cubic yards/day

\$ \_\_\_\_\_

d. Hydrogeological characteristics for land disposal

☐ Natural Clay

☐ Sand

☐ Compacted Clay

☐ Artificial Liner

\$ \_\_\_\_\_

e. For treatment or storage facilities:  
Is there surface water on the site?

☐ No

☐ Yes (\$75)

\$ \_\_\_\_\_

TOTAL FIXED FEE COST:

\$ \_\_\_\_\_

#### B. ☒ OPERATING LICENSE FEE

\$ 500.00

### XIV. OPERATOR CERTIFICATION

I certify under penalty of law that I have personally examined and am familiar with the information submitted in this application and all attachments and that, based on my inquiry of those persons immediately responsible for obtaining the information contained in the application, I believe that the information is true, accurate and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment.

A. NAME & OFFICIAL TITLE (type or print)

R. J. JONES, VICE PRESIDENT

B. SIGNATURE

*Robert Jones*

C. DATE SIGNED

11-4-88

### XV. OWNER CERTIFICATION

I certify under penalty of law that I have personally examined and am familiar with the information submitted in this application and all attachments and that, based on my inquiry of those persons immediately responsible for obtaining the information contained in the application, I believe that the information is true, accurate and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment.

A. NAME & OFFICIAL TITLE (type or print)

R. J. JONES, VICE PRESIDENT

B. SIGNATURE

*Robert Jones*

C. DATE SIGNED

11-4-88

### XVI. TITLEHOLDER OF LAND CERTIFICATION

I certify under penalty of law that I have personally examined and am familiar with the information submitted in this application and all attachments and that, based on my inquiry of those persons immediately responsible for obtaining the information contained in the application, I believe that the information is true, accurate and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment.

A. NAME & OFFICIAL TITLE (type or print)

B. SIGNATURE

C. DATE SIGNED

FORM 3 BCRA	 DNR	MICHIGAN DEPARTMENT OF NATURAL RESOURCES	I. EPA I.D. NUMBER FIMID020906764
-------------------	---	---	--------------------------------------

[illegible]

## II. FIRST OR REVISED APPLICATION

Place an "X" in the appropriate box in A or B below (mark one box only) to indicate whether this is the first application you are submitting for your facility or a revised application. If this is your first application and you already know your facility's EPA I.D. Number, or if this is a revised application, enter your facility's EPA I.D. Number in item 1 above.

A. FIRST APPLICATION (place an "X" below and provide the appropriate date):				B. NEW FACILITY (Complete item below):			
<input checked="" type="checkbox"/> 1. EXISTING FACILITY (See instructions for definition of "existing" facility. Complete item below.)				<input type="checkbox"/> 2. NEW FACILITY (Complete item below.)			
YR.	MO.	DAY	FOR EXISTING FACILITIES, PROVIDE THE DATE (YR., MO., & DAY) OPERATION BEGAN OR THE DATE CONSTRUCTION COMMENCED (Use the boxes to the left)	YR.	MO.	DAY	FOR NEW FACILITIES, PROVIDE THE DATE (YR., MO., & DAY) OPERATION BEGAN OR IS EXPECTED TO BEGIN
8	7	0	15				

### B. REVISED APPLICATION

1.

2.

### III. PROCESSES - CODES AND DESIGN CAPACITIES

A. **PROCESS CODES** - Enter the code from the list of process codes below that best describes each process to be used at the facility. Ten lines are provided for entering codes. If more lines are needed, enter the code(s) in the space provided. If a process will be used that is not included in the list of codes below, then describe the process (including its design capacity) in the space provided on the form (Item III-C).

2. PROCESS DESIGN CAPACITY - For each code entered in column A enter the capacity of the process

2. UNIT OF MEASURE - For each amount entered in column B(1), enter the code from the list of unit measure codes below that describes the unit of measure used. Only the units of measure that are listed below should be used.

PROCESS		PRO- CESS CODE	APPROPRIATE UNITS OF MEASURE FOR PROCESS DESIGN CAPACITY	PROCESS		PRO- CESS CODE	APPROPRIATE UNITS OF MEASURE FOR PROCESS DESIGN CAPACITY
<u>Storage:</u>				<u>Treatment:</u>			
CONTAINER (barrel, drum, etc.)		501	GALLONS OR LITERS	TANK		T01	GALLONS PER DAY OR LITERS PER DAY
TANK		502	GALLONS OR LITERS	SURFACE IMPOUNDMENT		T02	GALLONS PER DAY OR LITERS PER DAY
WASTE PILE		503	CUBIC YARDS OR CUBIC METERS	INCINERATOR		T03	TONS PER HOUR OR METRIC TONS PER HOUR; GALLONS PER HOUR OR LITERS PER HOUR
SURFACE IMPOUNDMENT		504	GALLONS OR LITERS				
<u>Disposal:</u>				<u>OTHER (Use for physical, chemical, thermal or biological treatment processes not occurring in tanks, surface impoundments or inciner- ators. Describe the processes in the space provided: Item III-C.)</u>			
INJECTION WELL		D79	GALLONS OR LITERS			T04	GALLONS PER DAY OR LITERS PER DAY
LANDFILL		D80	ACRE-FEET (the volume that would cover one acre to a depth of one foot) OR HECTARE-METER				
LAND APPLICATION		D81	ACRES OR HECTARES				
OCEAN DISPOSAL		D82	GALLONS PER DAY OR LITERS PER DAY				
SURFACE IMPOUNDMENT		D83	GALLONS OR LITERS				
UNIT OF MEASURE	UNIT OF MEASURE CODE	UNIT OF MEASURE	UNIT OF MEASURE CODE	UNIT OF MEASURE	UNIT OF MEASURE CODE	UNIT OF MEASURE	UNIT OF MEASURE CODE
GALLONS . . . . .	G	LITERS PER DAY . . . . .	V	ACRE-FEET . . . . .	A		
LITERS . . . . .	L	TONS PER HOUR . . . . .	F	HECTARE-METER . . . . .	H		
CUBIC YARDS . . . . .	Y	METRIC TONS PER HOUR . . . . .	W	ACRES . . . . .	S		
CUBIC METERS . . . . .	C	GALLONS PER HOUR . . . . .	E	HECTARES . . . . .	G		
GALLONS PER DAY . . . . .	U	LITERS PER HOUR . . . . .	H				

EXAMPLE FOR COMPLETING ITEM III. *Shown in line numbers X-1 and X-2 below:* A facility has two storage tanks, one tank can hold 200 gallons and the other can hold 400 gallons. The facility also has an incinerator that can burn up to 20 gallons per hour.

1  
C DUP 111

LINE NUMBER	A. PROCESS CODE (from list above)	B. PROCESS DESIGN CAPACITY		FOR OFFICIAL USE ONLY	LINE NUMBER	A. PROCESS CODE (from list above)	B. PROCESS DESIGN CAPACITY		FOR OFFICIAL USE ONLY
		1. AMOUNT (specify)	2. UNIT OF MEASURE (enter code)				1. AMOUNT	2. UNIT OF MEASURE (enter code)	
X-1	S 0 2	600	G		5				
X-2	T 0 3	20	E		6				
1	S 0 1	21,900	G		7				
2					8				
3					9				
4					10				

**III. PROCESSES (continued)**

C. SPACE FOR ADDITIONAL PROCESS CODES OR FOR DESCRIBING OTHER PROCESSES (code "T04"). FOR EACH PROCESS ENTERED HERE INCLUDE DESIGN CAPACITY.

**IV. DESCRIPTION OF HAZARDOUS WASTES**

A. EPA HAZARDOUS WASTE NUMBER — Enter the four-digit number from 40 CFR, Subpart D for each listed hazardous waste you will handle. If you handle hazardous wastes which are not listed in 40 CFR, Subpart D, enter the four-digit number(s) from 40 CFR, Subpart C that describes the characteristics and/or the toxic contaminants of those hazardous wastes.

B. ESTIMATED ANNUAL QUANTITY — For each listed waste entered in column A estimate the quantity of that waste that will be handled on an annual basis. For each characteristic or toxic contaminant entered in column A estimate the total annual quantity of all the non-listed waste(s) that will be handled which possess that characteristic or contaminant.

C. UNIT OF MEASURE — For each quantity entered in column B enter the unit of measure code. Units of measure which must be used and the appropriate codes are:

ENGLISH UNIT OF MEASURE	CODE	METRIC UNIT OF MEASURE	CODE
POUNDS . . . . .	P	KILOGRAMS . . . . .	K
TONS . . . . .	T	METRIC TONS . . . . .	M

If facility records use any other unit of measure for quantity, the units of measure must be converted into one of the required units of measure taking into account the appropriate density or specific gravity of the waste.

**D. PROCESSES****1. PROCESS CODES:**

For listed hazardous wastes: For each listed hazardous waste entered in column A select the code(s) from the list of process codes contained in Item III to indicate how the waste will be stored, treated, and/or disposed of at the facility.

For non-listed hazardous wastes: For each characteristic or toxic contaminant entered in column A, select the code(s) from the list of process codes contained in Item III to indicate all the processes that will be used to store, treat, and/or dispose of all the non-listed hazardous wastes that possess that characteristic or toxic contaminant.

Notes: Four spaces are provided for entering process codes. If more are needed: (1) Enter the first three as described above; (2) Enter "000" in the extreme right box of Item IV-D(1); and (3) Enter in the space provided on page 4, the line number and the additional code(s).

2. PROCESS DESCRIPTION: If a code is not listed for a process that will be used, describe the process in the space provided on the form.

**NOTE: HAZARDOUS WASTES DESCRIBED BY MORE THAN ONE EPA HAZARDOUS WASTE NUMBER** — Hazardous wastes that can be described by more than one EPA Hazardous Waste Number shall be described on the form as follows:

1. Select one of the EPA Hazardous Waste Numbers and enter it in column A. On the same line complete columns B, C, and D by estimating the total annual quantity of the waste and describing all the processes to be used to treat, store, and/or dispose of the waste.
2. In column A of the next line enter the other EPA Hazardous Waste Number that can be used to describe the waste. In column D(2) on that line enter "included with above" and make no other entries on that line.
3. Repeat step 2 for each other EPA Hazardous Waste Number that can be used to describe the hazardous waste.

**EXAMPLE FOR COMPLETING ITEM IV (shown in line numbers X-1, X-2, X-3, and X-4 below)** — A facility will treat and dispose of an estimated 900 pounds per year of chrome slavings from leather tanning and finishing operation. In addition, the facility will treat and dispose of three non-listed wastes. Two wastes are corrosive only and there will be an estimated 200 pounds per year of each waste. The other waste is corrosive and ignitable and there will be an estimated 100 pounds per year of that waste. Treatment will be in an incinerator and disposal will be in a landfill.

LINE NO. X-1 X-2 X-3 X-4	A. EPA HAZARDOUS WASTE NO. (enter code)	B. ESTIMATED ANNUAL QUANTITY OF WASTE	C. UNIT OF MEASURE (enter code)	D. PROCESSES	
				1. PROCESS CODES (enter)	2. PROCESS DESCRIPTION (if a code is not entered in D(1))
X-1	K 0 5 4	900	P	T 0 3 D 8 0	
X-2	D 0 0 2	400	P	T 0 3 D 8 0	
X-3	D 0 0 1	100	P	T 0 3 D 8 0	
X-4	D 0 0 2				included with above

Continued from page 2.

NOTE: Photocopy this page before completing if you have more than 25 wastes to list.

EPA I.D. NUMBER (enter from page 1)										FOR OFFICIAL USE ONLY									
I D 0 2 0 9 0 6 7 6 4										W D U P 12 D U P									
DESCRIPTION OF HAZARDOUS WASTES (continued)										D. PROCESSES									
LINE NO.	A. EPA HAZARD. WASTE NO. (enter code)	B. ESTIMATED ANNUAL QUANTITY OF WASTE	C. UNIT OF MEASURE (enter code)	1. PROCESS CODES (enter)								2. PROCESS DESCRIPTION (if a code is not entered in 2(1))							
				1	2	3	4	5	6	7	8	1	2	3	4	5	6	7	8
1	F 0 0 1	1,000,000	P	S	0	1													
2	F 0 0 2	175,000	P	S	0	2													
3																			
4																			
5																			
6																			
7																			
8																			
9																			
10																			
11																			
12																			
13																			
14																			
15																			
16																			
17																			
18																			
19																			
20																			
21																			
22																			
23																			
24																			
25																			
26																			

CONTINUE ON REVERS



**IV. DESCRIPTION OF HAZARDOUS WASTES (continued)**

E. USE THIS SPACE TO LIST ADDITIONAL PROCESS CODES FROM ITEM D(1) ON PAGE 3.

EPA I.D. NO. (enter from page 1)

F	I	D	0	2	0	9	0	6	7	6	4	T	I	N	C
16															

**V. FACILITY DRAWING**

All existing facilities must include in the space provided on page 5 a scale drawing of the facility (see instructions for more detail).

**VI. PHOTOGRAPHS**

All existing facilities must include photographs (aerial or ground-level) that clearly delineate all existing structures; existing storage, treatment and disposal areas; and sites of future storage, treatment or disposal areas (see instructions for more detail).

**VII. FACILITY GEOGRAPHIC LOCATION**

LATITUDE (degrees, minutes, &amp; seconds)

LONGITUDE (degrees, minutes, &amp; seconds)

4	2	5	6	2	5
50	50	57	50	50	51

8	5	4	0	2	0
72	74	73	76	77	79

**VIII. GENERAL INFORMATION**

Attach each of the following as separate attachments to the application:

- |                                 |                            |                               |
|---------------------------------|----------------------------|-------------------------------|
| 1. General facility description | 6. Contingency plan        | 11. Closure/post-closure plan |
| 2. Chemical & physical analysis | 7. Preparedness/prevention | 12. Cost estimates            |
| 3. Waste analysis plan          | 8. Traffic information     | 13. Liability mechanism       |
| 4. Security procedures          | 9. Location information    | 14. Financial assurance       |
| 5. Inspection schedule          | 10. Training program       | 15. Topographic map           |

**IX. SUPPLEMENTAL INFORMATION**

Attach for all applications:

- Hydrogeological report
- Environmental assessment
- Environmental monitoring program
- Engineering plans

Attach for operating license applications only:

- For new facilities, construction certificate
- Capability certification/compliance schedule
- Proof of other permits or licenses
- Restrictive covenant (landfills only)

**X. FACILITY SPECIFIC INFORMATION**

Attach the required technical information for each of the following:

- |                                      |                         |
|--------------------------------------|-------------------------|
| 1. Containers                        | 5. Surface impoundments |
| 2. Tanks                             | 6. Waste piles          |
| 3. Incineration or thermal treatment | 7. Landfills            |
| 4. Treatment                         | 8. Land treatment       |

SEE ATTACHMENT A-2

CONTENT OF CONSTRUCTION PERMIT AND OPERATING LICENSE APPLICATIONS

CONSTRUCTION PERMIT APPLICATION FEE [R 299.9504(1)(a)]

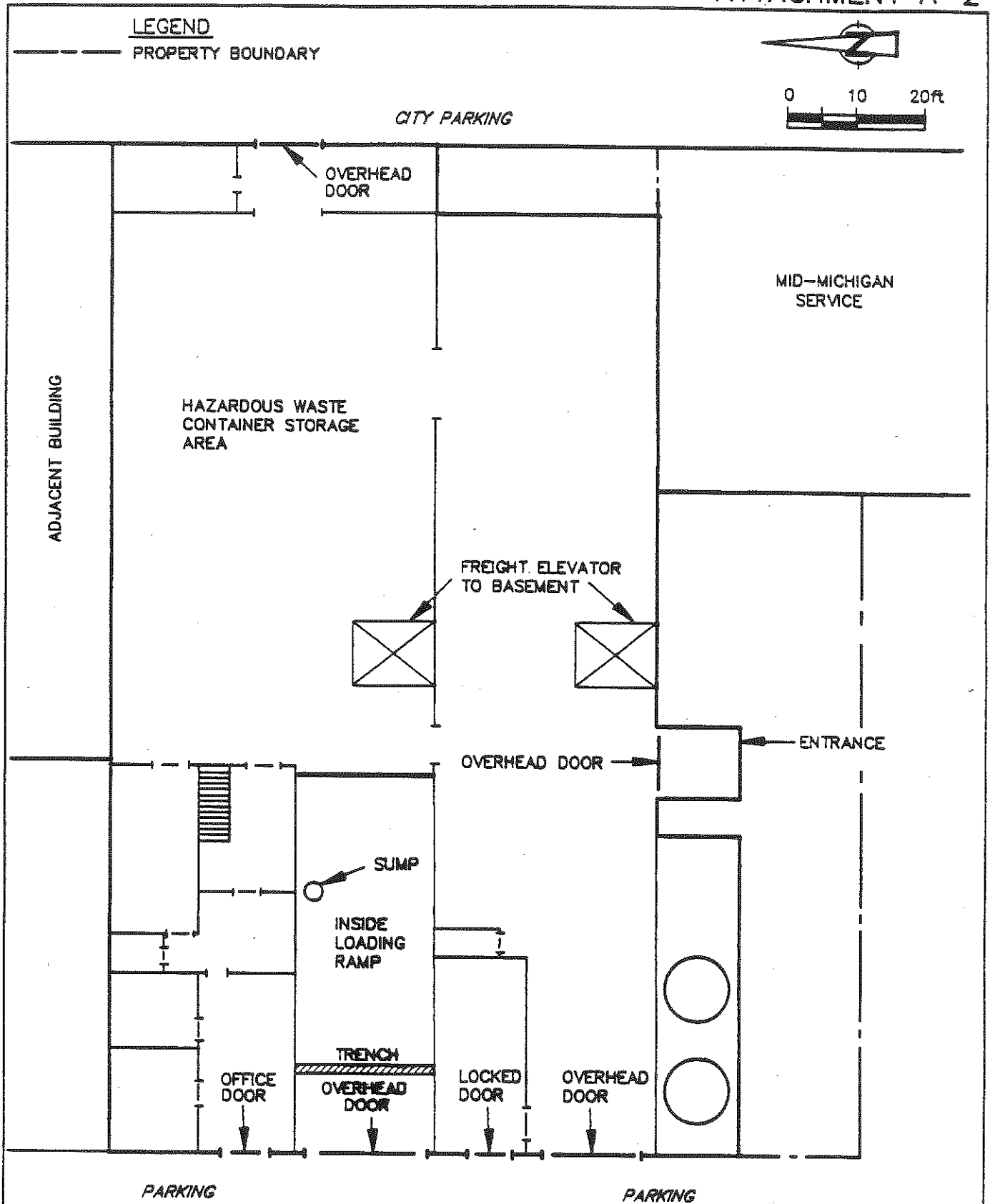
Provide the construction permit application fee or deposit as calculated in R 299.9507.

- (1) The applicant shall calculate the construction permit application fee by totalling the appropriate fees in items (1), (2), (3), and (4) of Table 501 of R 299.9523. Each construction permit application requires a separate application fee.
- (2) A check made payable to the "State of Michigan" for the calculated fee shall be attached to the construction permit application.
- (3) The applicant may request, upon application submittal, that the application fee be based on the cost of review, which consists of actual work hours required for construction permit review plus the cost of any public notices published or broadcast. The request shall be made, in writing, on the construction permit application. The applicant shall be assessed the actual review cost fee. A construction permit shall not be issued by the Director until all fees required by this rule are paid in full. If the actual review cost fee is less than the calculated fee, the difference between the actual review cost fee and the calculated fee submitted with the application shall be refunded within 60 days after the construction permit is approved or denied.
- (4) An applicant who has requested that the application fee be based on actual review costs forfeits the further opportunity to use calculated fees according to Table 501 of R 299.9523.
- (5) If a construction permit application is not resubmitted after being found to be administratively incomplete, the application fee, minus the cost of all public notices published or broadcast, shall be refunded.
- (6) If a construction permit application is denied, no portion of the application fee shall be refunded.
- (7) An applicant who makes a reapplication for a revised proposal within 6 months of denial shall be assessed only the actual costs to review the revised proposal. These actual costs shall not exceed the calculated fee from Table 501 of R 299.9523.
- (8) An applicant who withdraws complete construction permit applications within 14 days of receipt by the Director shall

ATTACHMENT  
A-2

ATTACHMENT A-2

FACILITY PLAN



RECEIVED  
 ELSWORTH STREET

JUN 20 1989

FACILITY PLAN  
 Detrex Corporation  
 Gold Shield Solvents, Grand Rapids

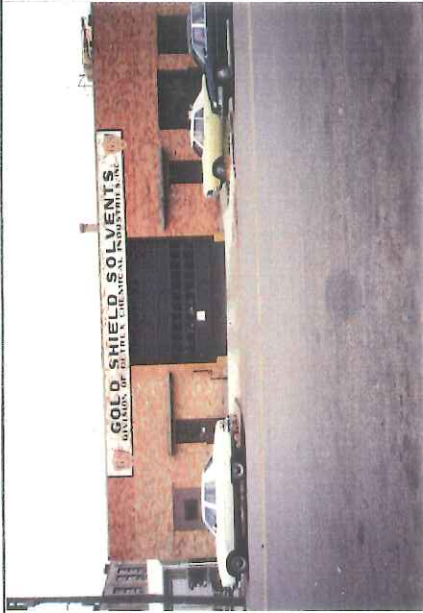
CRA

ATTACHMENT  
A-3

ATTACHMENT A-3

FACILITY PHOTOGRAPHS





PHOTOGRAPH 01 - VIEW OF GOLD SHIELD SOLVENTS BUILDING FROM ELLSWORTH AVENUE FACING EAST



PHOTOGRAPH 02 - VIEW OF LOADING/UNLOADING AREA FACING EAST



PHOTOGRAPH 03 - VIEW OF WARNING SIGN ON DOORWAY ENTERING HAZARDOUS WASTE CONTAINER STORAGE AREA

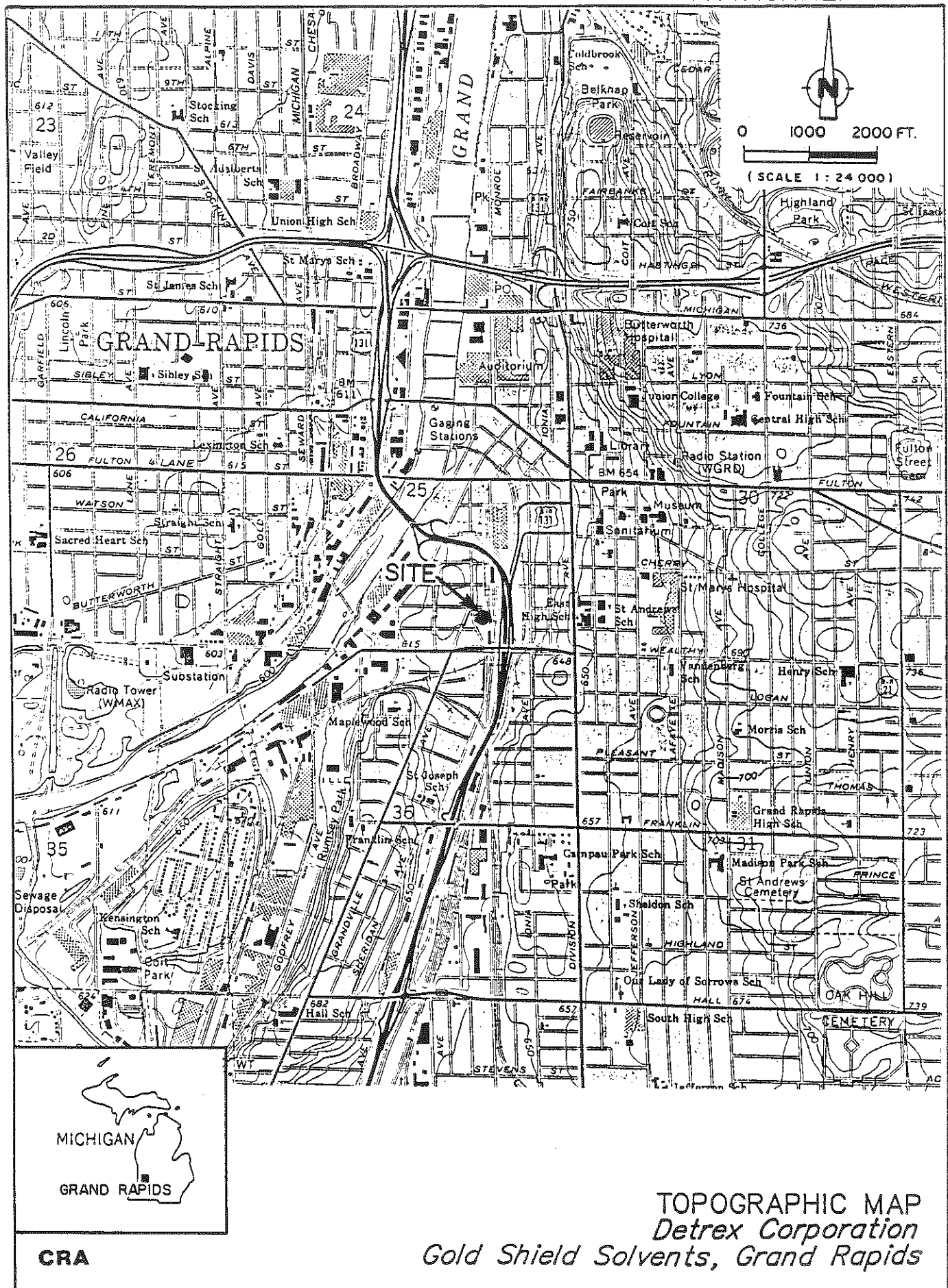


PHOTOGRAPH 04 - VIEW OF HAZARDOUS WASTE CONTAINER STORAGE AREA FACING NORTH

ATTACHMENT  
A-4

ATTACHMENT A-4

SURROUNDING AREA TOPOGRAPHIC MAP





Date: 11/08/88  
Revision: 88-0  
Page: B-1

## SECTION B

### GENERAL DESCRIPTION

TABLE OF CONTENTS

	<u>Page</u>
SECTION B	
FACILITY DESCRIPTION	
B-1 FACILITY DESCRIPTION [40 CFR §270.14(b)(1)]	B-5
B-2 TOPOGRAPHIC MAP [40 CFR §270.14(b)(19)]	B-6
B-2a General Requirements [40 CFR §270.14(b)]	B-6
B-2b Additional Requirements for Land Disposal Facilities [40 CFR §270.14(c)/§264.95/§264.97]	B-9
B-3 FACILITY LOCATION [40 CFR §270.14(b)(11)]	B-10
B-3a Seismic Standard	B-10
B-3a Floodplain Standard	B-10
B-4 TRAFFIC INFORMATION [40 CFR §270.14(b)(10)]	B-11

LIST OF TABLES

	<u>Page</u>
TABLE B-1 LOCATION IN APPLICATION OF TOPOGRAPHIC MAP REQUIREMENTS	B-7

LIST OF ATTACHMENTS

ATTACHMENT B-1	LOCATION PLAN
ATTACHMENT B-2	TOPOGRAPHIC MAP
ATTACHMENT B-3	ZONING MAP
ATTACHMENT B-4	WIND ROSE
ATTACHMENT B-5	ACCESS CONTROL AND LOADING/UNLOADING AREA
ATTACHMENT B-6	SEWERS
ATTACHMENT B-7	HAZARDOUS WASTE CONTAINER STORAGE AREA LOCATION
ATTACHMENT B-8	FEDERAL INSURANCE ADMINISTRATION (FIA) FLOOD MAP
ATTACHMENT B-9	LEGAL DESCRIPTION AND LEGAL PROPERTY SURVEY



Date: 11/08/88

Revision: 88-0

Page: B-4

## **SECTION B**

### **FACILITY DESCRIPTION**

This section of the operating license application provides a general description of the Detrex Corporation Gold Shield Solvents facility in Grand Rapids, Michigan as required by Michigan Act 64 Rule 299.9504(1)(c) which incorporates 40 CFR 270.14(b) and (c) by reference. The applicable section(s) of the federal regulations (40 CFR) is referenced where appropriate.

Date: 11/08/88

Revision: 88-0

Page: B-5

**B-1 FACILITY DESCRIPTION [40 CFR §270.14(b)(1)]**

This Operating License Application is submitted by Detrex Corporation, for the hazardous waste container storage area at the Gold Shield Solvents facility located on Ellsworth Avenue in Grand Rapids, Michigan. The Gold Shield Solvents facility is a treatment, storage, disposal (TSD) facility, by definition, for halogenated hydrocarbon solvents and spent solvents.

Gold Shield Solvents is located in Grand Rapids, Michigan. The Street address is:

312 Ellsworth Avenue S.W.  
Grand Rapids, Michigan 49503

The principal contact person for this Application is:

Mr. C. U. Guy  
Manager of Environmental Compliance  
P.O. Box 1398  
Ashtabula, Ohio 44004  
(216) 997-6131

Gold Shield Solvents specializes in the sale of halogenated solvents and cleaning equipment and the collection of solvent wastes generated in degreasing and other cleaning operations. The facility operates under EPA Identification Number MID020906764. The Standard Industrial Classification Code (SIC Code) for the facility is 2869.

The hazardous waste operation at the Gold Shield Solvents facility in Grand Rapids, Michigan consists of a hazardous waste container storage area used for the storage of drummed solvent wastes prior to the transfer of these wastes to an off-site Detrex solvent reclamation (recycling) facility or to an off-site permitted treatment/disposal facility.

All wastes accepted at the Gold Shield Solvents facility are classified as F001 or F002 hazardous wastes under 40 CFR Part 261.

**B-2 TOPOGRAPHIC MAP [40 CFR §270.14(b)(19)]**

**B-2a General Requirements [40 CFR §270.14(b)]**

The topographic mapping and other location information requirements are listed on Table B-1 with the location in this operating license application where the appropriate map/information is located. Provided as Attachment B-1 is a figure that locates Grand Rapids within the State of Michigan and the Detrex Gold Shield Solvents facility within the City of Grand Rapids.

**1) Topographic Map**

Attachment B-2 provides topographic maps, at a scale of 1" = 200', extending at least 1000 feet beyond the building leased by Detrex Corporation. Contours are provided at 2 foot intervals to indicate surface water flow patterns.

**2) Land Use**

Provided in Attachment B-3 is a copy of the zoning/land use map for the City of Grand Rapids in the area of the Gold Shield Solvents facility. All the land in the vicinity of the Gold Shield Solvents facility is zoned I-1. According to the Zoning Ordinance of the City of Grand Rapids:

"This zone permits most light industrial and manufacturing uses, compounding, assembling or treatment of articles or materials with the exception of heavy manufacturing and processing of raw materials."

**3) Wind Rose**

A copy of a windrose, provided by the National Climatic Data Center, from the Grand Rapids airport is provided in Attachment B-4. This windrose indicates that the prevailing winds in Grand Rapids are from the west to the east.

**4) Legal Boundaries**

A copy of the legal description and/or legal plan of the lands leased by Detrex Corporation was not available at the time the permit application was submitted. Detrex Corporation is in the process of obtaining a legal description and/or legal plan of the lands and will amend the operating license application, if and when available. A description of the property leased by Detrex, as obtained from the Grand Rapids Taxation Department, reads as follows:

**B-2 TOPOGRAPHIC MAP [40 CFR §270.14(b)(19)]**

**B-2a General Requirements [40 CFR §270.14(b)]**

The topographic mapping and other location information requirements are listed on Table B-1 with the location in this operating license application where the appropriate map/information is located. Provided as Attachment B-1 is a figure that locates Grand Rapids within the State of Michigan and the Detrex Gold Shield Solvents facility within the City of Grand Rapids.

**1) Topographic Map**

Attachment B-2 provides topographic maps, at a scale of 1" = 200', extending at least 1000 feet beyond the building leased by Detrex Corporation. Contours are provided at 2-foot intervals to indicate surface water flow patterns.

**2) Land Use**

Provided in Attachment B-3 is a copy of the zoning/land use map for the City of Grand Rapids in the area of the Gold Shield Solvents facility. All the land in the vicinity of the Gold Shield Solvents facility is zoned I-1. According to the Zoning Ordinance of the City of Grand Rapids:

"This zone permits most light industrial and manufacturing uses, compounding, assembling or treatment of articles or materials with the exception of heavy manufacturing and processing of raw materials."

**3) Wind Rose**

A copy of a windrose, provided by the National Climatic Data Center, from the Grand Rapids airport is provided in Attachment B-4. This windrose indicates that the prevailing winds in Grand Rapids are from the west to the east.

**4) Legal Boundaries**

A copy of the legal description and legal plan of the lands leased by Detrex Corporation is provided in Attachment B-9. The legal plan is at a scale of 1"=20' and extends a minimum of 125 feet beyond the building leased by Detrex. Surface contours are also provided at 1-foot intervals to indicate surface water flow patterns.

TABLE B-1

LOCATION IN APPLICATION OF TOPOGRAPHIC MAP REQUIREMENTS

Items Required By 40 CFR §270.14(b)(19) For Topographic Maps	Location In Application (Attachment Nos.)*
1. Topographic maps	B-2; B-9
2. Contour intervals	B-2, B-9
3. Map scale and date	B-1, B-2, B-5, B-7, B-8, B-9
4. Orientation of map (i.e. North arrow)	B-1, B-2, B-3, B-5, B-7, B-8, B-9
5. Property Line	B-5, B-7, B-9
6. Surrounding land uses	B-3
7. Surface water	B-2
8. Wind rose	B-4
9. Hazardous waste container storage area	B-7
10. 100-year floodplain area	B-8
11. Location of access control (i.e. doors)	B-5
12. Access and internal roads	N/A
13. Drainage barriers	N/A
14. Run-off control systems	N/A
15. Buildings and structures	B-2, B-5, B-7, B-9
16. Sewers (i.e. sanitary, storm)	B-6, B-9
17. Loading/unloading area	B-5
18. Fire control facilities	B-2
19. Withdrawal wells	N/A
20. Injection wells	N/A
21. Groundwater information (i.e. point of compliance, monitoring wells, groundwater flow direction and rate)	B-7

\* N/A - Not Applicable

5) Access Control

Access into the Gold Shield Solvents warehouse type building is controlled by security doors and overhead doors that remain locked at all times when the facility is unattended. Attachment B-5 shows the location of the various access points to the facility. Access is restricted to all but authorized persons.

6) Injection and Withdrawal Wells

There are no available records of any groundwater injection wells within a one mile radius of the Gold Shield Solvents facility. A well survey was conducted by the MDNR Geologic Survey Division for a minimum 1-mile radius around the facility. The well survey area and copies of water well records are presented in Attachment E-1 of this operating license application.

7) Sewers

The location of sewers in the area of facility is provided in Attachment B-6. There are no process sewers for the Gold Shield Solvents facility.

8) Loading and Unloading Areas

The loading and unloading area associated with the hazardous waste container storage area at the Gold Shield Solvents facility is shown in Attachment B-5. The loading/unloading area is internal to the building with direct access from Ellsworth Avenue. A sump is located in the base of the loading/unloading ramp. The sump is connected to the storm sewer. The cover to the sump has recently been fitted with a gasket, bolted down and coated with an epoxy sealant.

9) Fire Control

Fire control is provided by fire extinguishers located within the facility and by the Grand Rapids Fire Department. Fire hydrants in the immediate vicinity of the facility are located on Attachment B-2. The closest hydrant is located approximately 150 feet northwest of the facility along Ellsworth Avenue.

10) Flood Control

As indicated in Section B-3b of this operating license application, the Detrex Gold Shield Solvents facility is not located in an area designated as a 100-year floodplain. As such, flood control structures/devices are not required. Notwithstanding the above, flood prevention is provided by the enclosed building structure that houses the hazardous waste container storage area.

11) Runoff Control

The topographic maps provided in Attachment B-2 indicate the surface water drainage pattern around the facility. Surface water runoff is directed away from the building structure with the exception of the loading/unloading ramp.

The loading/unloading ramp slopes downward inside the facility. During periods of heavy precipitation, stormwater flows into the ramp area and drains to a sump that is connected to the storm sewer.

In order to minimize flow into the ramp area, Detrex Corporation recently constructed an interceptor trench across the entire width of the ramp. The interceptor trench is constructed of concrete with an overlying steel grate. The trench is located approximately 12 feet inside the overhead door to the loading/unloading ramp. The ramp is approximately 20 feet long, 11 inches wide and 8 inches deep with a total capacity of approximately 92 gallons. The trench is connected to the sump via a 4-inch diameter PVC pipe. The location of the trench is shown on Attachment B-5 and details of the trench are provided in Section D.

12) Hazardous Waste Container Storage Area

Provided in Attachment B-7 is a figure detailing the location of the hazardous waste container storage area within the Gold Shield Solvents building.

B-2b Additional Requirements for  
Land Disposal Facilities

[40 CFR §270.14(c)(3), §270.25(c)(4), §264.95 and  
§264.97]

Detrex Corporation does not and has never had a hazardous waste land disposal facility at the Gold Shield Solvents facility in Grand Rapids, Michigan.

Date: 11/08/88

Revision: 88-0

Page: B-10

**B-3 FACILITY LOCATION [40 CFR §270.14(b)(11)]**

**B-3a Seismic Standard**

The Detrex Corporation Gold Shield Solvents facility is located in Kent County, Grand Rapids, Michigan.

The seismic standard is not applicable to facilities located in Michigan.

**B-3b Floodplain Standard  
[40 CFR §270.14(b)(11)(iii), §264.18(b)]**

Attachment B-8 shows the portion of the Federal Insurance Administration (FIA) flood map for the City of Grand Rapids relative to the Gold Shield Solvents facility. The FIA map indicates that the facility is in neither the 100-year nor the 500-year floodplain. This area is entirely within Zone C indicating it is not subject to flooding.



**B-4 TRAFFIC INFORMATION [40 CFR §270.14(b)(10)]**

Vehicular access to the facility is directly from Ellsworth Avenue. Employees and visitors park directly in front of the building.

All traffic associated with the movement of drummed hazardous waste occurs directly in front of and internal to the building. All incoming drummed hazardous wastes arrive by truck. Typically, one truck arrives per day transporting drummed hazardous wastes. A forklift truck is used within the building. Wastes are transported off site at a frequency of approximately two trucks per month.

There are no internal roads on site. The facility is immediately adjacent to Ellsworth Avenue (see Attachment B-5), thus, access to the facility is directly from the city street.



ATTACHMENT B-1

SITE LOCATION



ATTACHMENT  
B-2

ATTACHMENT B-2

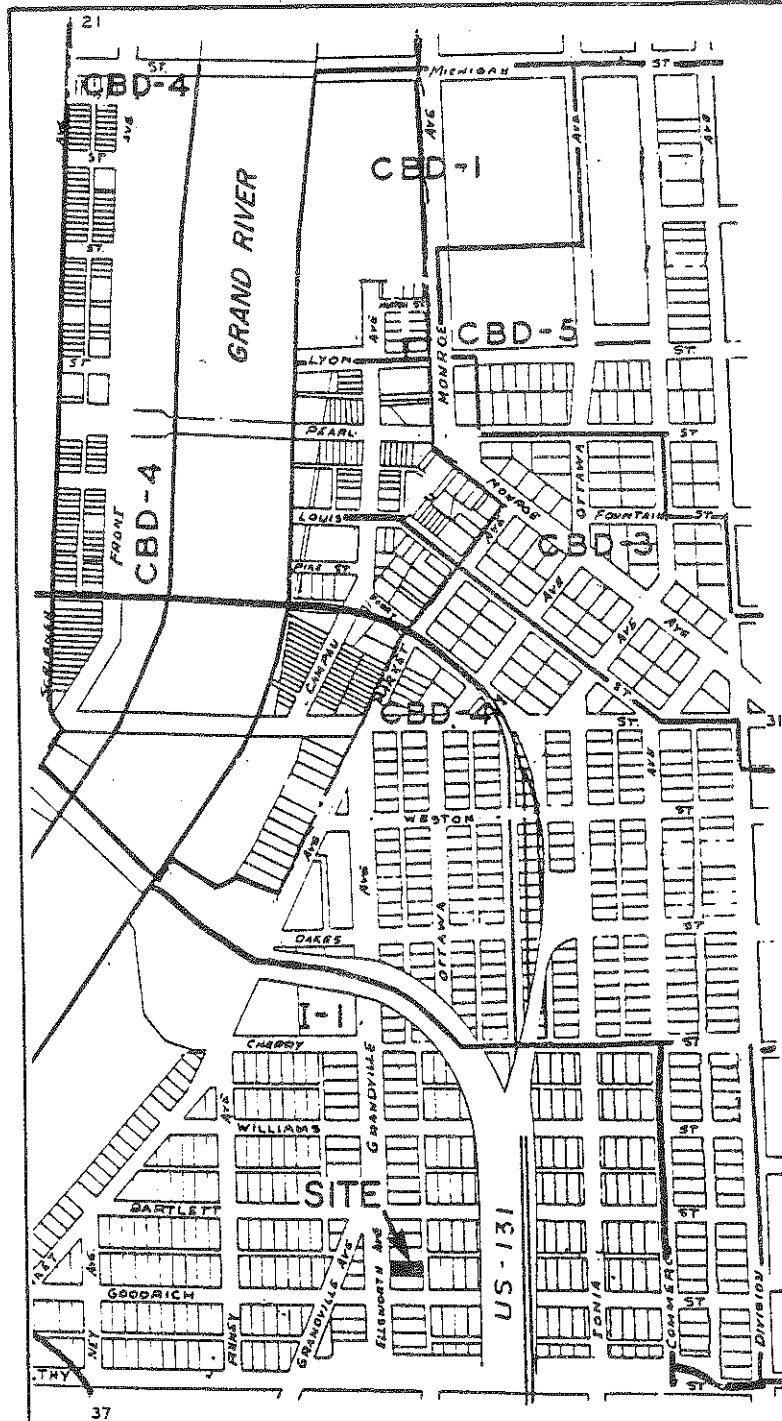
TOPOGRAPHIC MAP

ATTACHMENT  
B-3

ATTACHMENT B-3

ZONING/LAND USE PLAN





## LEGEND

- R-1 ONE FAMILY ZONE
- R-2 ONE AND TWO FAMILY ZONE
- R-3 LOW DENSITY MULTIPLE FAMILY ZONE
- R-4 MEDIUM DENSITY MULTIPLE FAMILY ZONE
- R-5 HIGH DENSITY MULTIPLE FAMILY ZONE
- SR SPECIAL RESIDENTIAL ZONE
- F FLOOD ZONE
- C-1 NEIGHBORHOOD COMMERCIAL ZONE
- C-2 COMMUNITY COMMERCIAL ZONE
- C-3 CENTRAL BUSINESS DISTRICT ZONE
  - a. CBD-1 CIVIC CENTER DISTRICT
  - b. CBD-2 CULTURAL CENTER DISTRICT
  - c. CBD-3 CENTRAL COMMERCIAL DISTRICT
  - d. CBD-4 SPECIAL ECONOMIC DEVELOPMENT DISTRICT
  - e. CBD-5 OFFICE AND FINANCIAL DISTRICT
- C-4 HEAVY COMMERCIAL ZONE
- PSC PLANNED SHOPPING CENTER ZONE
- I-1 LIGHT INDUSTRIAL ZONE
- PID PLANNED INDUSTRIAL PARK ZONE
- I-2 HEAVY INDUSTRIAL ZONE

CRA

ZONING/LAND USE MAP  
*Detrex Corporation*  
*Gold Shield Solvents, Grand Rapids*

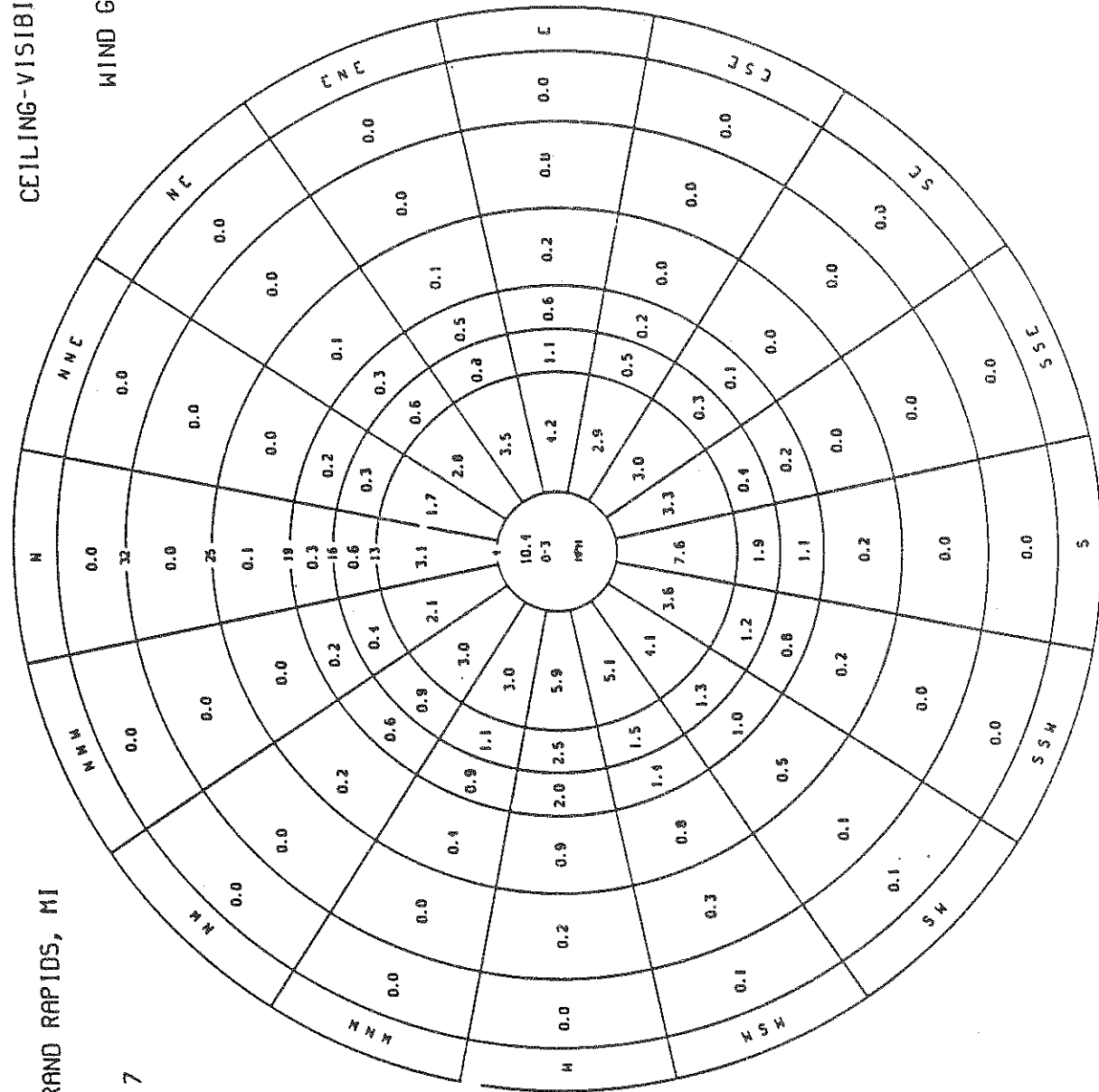
ATTACHMENT  
B-4

ATTACHMENT B-4

WIND ROSE

CEILING-VISIBILITY

WIND GRAPH



GRR GRAND RAPIDS, MI

CLASS 7

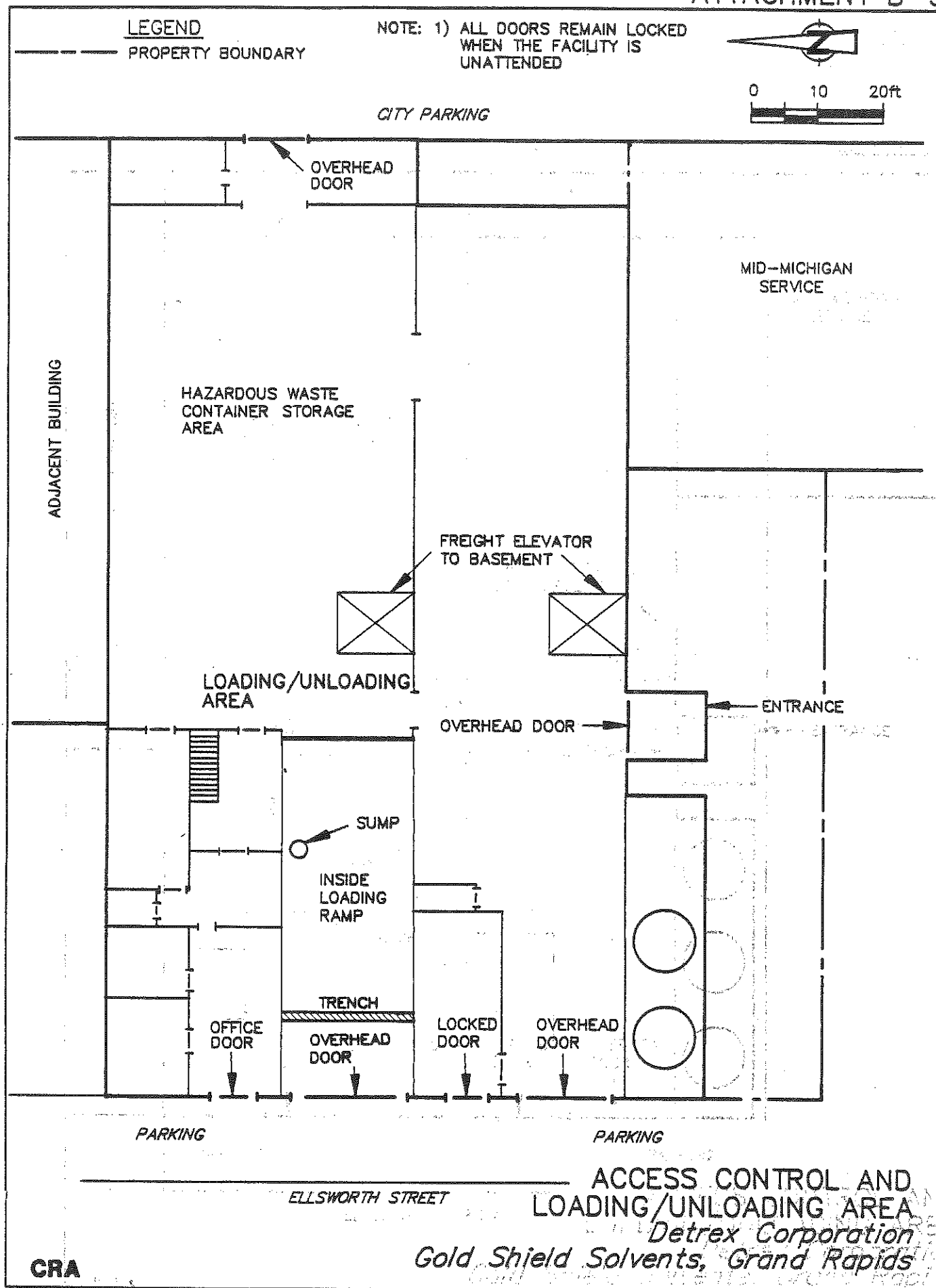
WIND ROSE  
Detrex Corporation  
Gold Shield Solvents, Grand Rapids

CRA

ATTACHMENT  
B-5

ATTACHMENT B-5

ACCESS CONTROL AND LOADING/UNLOADING AREA



CRA

2471-4/11/88-6-D-0

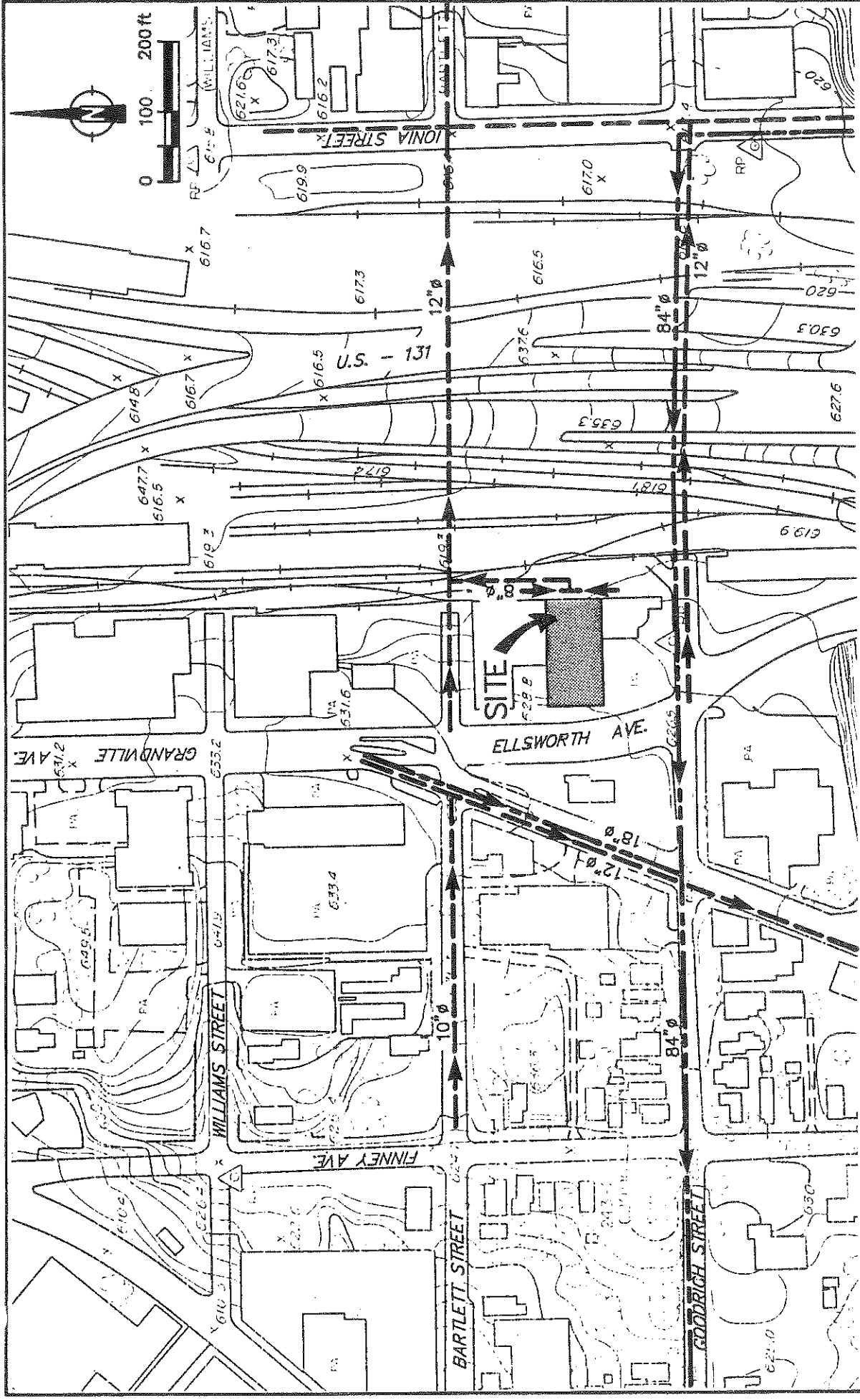
ATTACHMENT  
B-6



ATTACHMENT B-6

SEWERS

SEWER SCHEMATIC PLAN  
*Detrex Corporation*  
*Gold Shield Solvents, Grand Rapids*



LEGEND

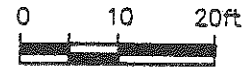
- SANITARY SEWER
- - - STORM SEWER
- ➔ DIRECTION OF FLOW

**CRA**

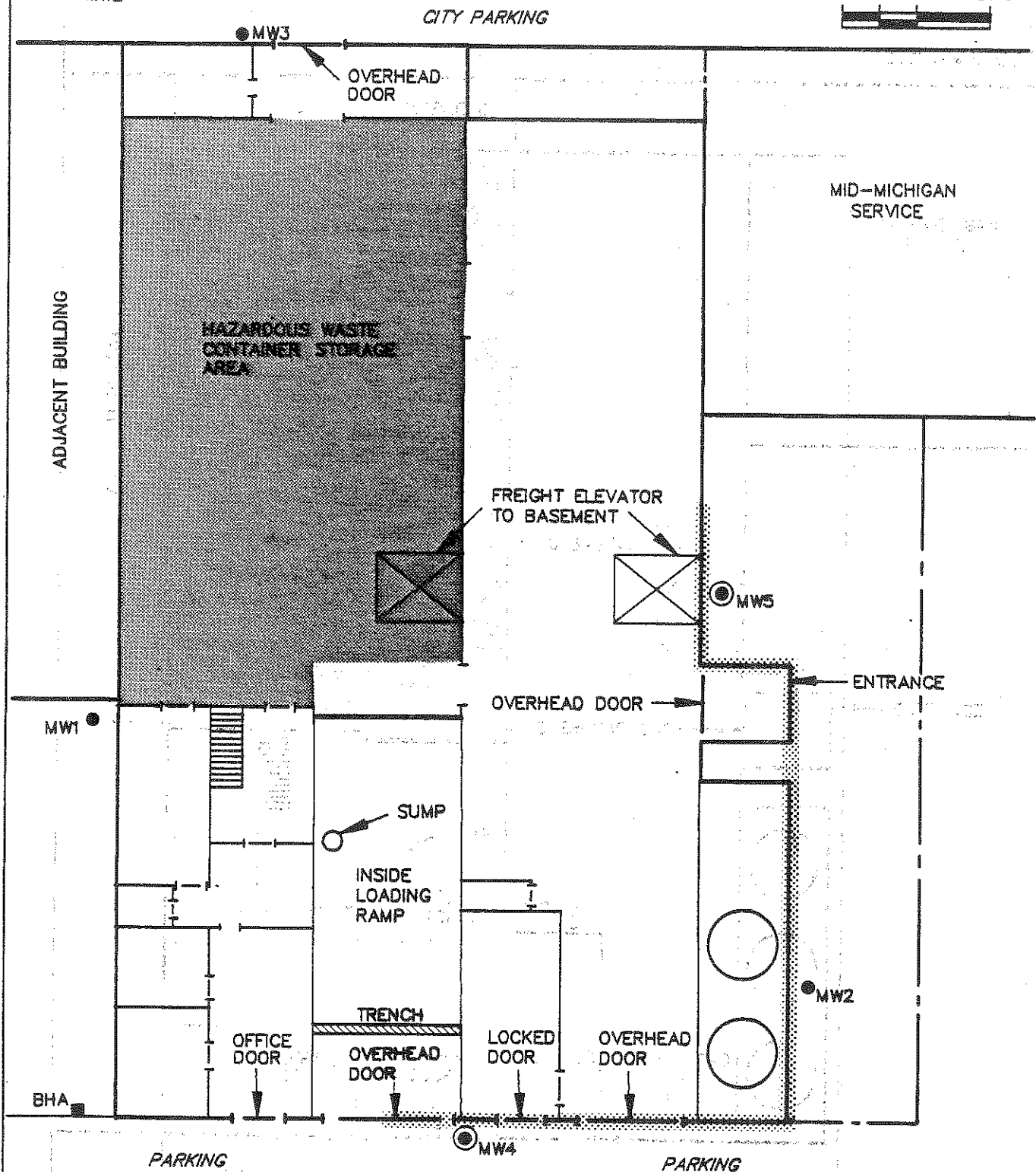
ATTACHMENT  
B-7

ATTACHMENT B-7

HAZARDOUS WASTE CONTAINER STORAGE AREA LOCATION



① MW4 PROPOSED MONITORING WELL LOCATION



# HAZARDOUS WASTE CONTAINER STORAGE AREA LOCATION

*Detrex Corporation*

*Gold Shield Solvents, Grand Rapids*

**CRA**

ATTACHMENT  
B-8

ATTACHMENT B-8

FEDERAL INSURANCE ADMINISTRATION

(FIA) FLOOD MAP





ATTACHMENT B-9

LEGAL DESCRIPTION

AND

LEGAL PROPERTY SURVEY

## COMMITMENT FOR TITLE INSURANCE

**First American Title Insurance Company**  
 of the Mid-West.

1650 W. BIG BEAVER ROAD  
 P.O. BOX 1288

TROY, MICHIGAN 48069

EFFECTIVE DATE: May 9, 1989 @ 8:00 A.M. COMMITMENT NO. 41-77717

FIRST AMERICAN TITLE INSURANCE COMPANY of the MID-WEST, a Missouri Corporation, hereby agrees to issue a policy of title insurance as hereinafter set forth upon payment of the prescribed premium. THE POLICY WILL BE ISSUED SUBJECT TO EACH ENCUMBRANCE AND EXCEPTION LISTED BELOW, OR WHICH ARISES AFTER THE EFFECTIVE DATE HEREOF, UNLESS ELIMINATED TO OUR SATISFACTION.

FORM OF POLICY  
 TO BE ISSUED

A.L.T.A. OWNER'S POLICY

\$ INFORMATIVE

A.L.T.A. MORTGAGE POLICY  
 WITHOUT EXCEPTIONS

\$ NONE

A.L.T.A. MORTGAGE POLICY  
 WITH EXCEPTIONS

\$ NONE

PARTY TO BE INSURED

OWNER'S POLICY: INFORMATIVE COMMITMENT  
 MORTGAGE POLICY: NONE

DESCRIPTION OF REAL ESTATE

Situated in CITY OF GRAND RAPIDS, KENT County, Michigan

LEGAL DESCRIPTION ON PAGE 2

312 Ellsworth Ave. SW

OWNER, ENCUMBRANCES, EXCEPTIONS AND REQUIREMENTS

1. Owner: Robert D. Keegstra and Angelyn J. Keegstra, husband and wife, as to an undivided 1/2 interest; Raymond Bush, Howard Bush, Ernest Bush, as joint tenants with full rights of survivorship and not as tenants in common, as to an undivided 1/2 interest
2. The unrecorded land contract vendors interest of Angelyn J. Keegstra, Trustee of the Angelyn J. Keegstra Trust dated April 23, 1975.
3. The unrecorded land contract vendee's interest of Ellsworth Land Corporation, a Michigan Corporation.
4. Terms, covenants and conditions of the land contracts recited above.
5. Loss or damage sustained by reason of the above land contract Vendee's interest not being properly evidenced of record.
6. Right of way granted to Consumers Power Company as disclosed by the instrument recorded in Liber 1878 of Deeds, Page 589, Kent County Records.
7. Rights reserved by the City of Grand Rapids in parts of said alley as disclosed by the instrument recorded in Liber 1907 of Deeds, Page 362, Kent County Records.
8. Unrecorded leasehold interest of Detrex Chemical Industries, Inc.

(CONTINUED ON PAGE 2)

If countersigned by an authorized officer or agent of the company,  
 this commitment is valid and binding for a period of 90 days from the date hereof.

COUNTERSIGNED:

**First American Title Insurance Company**  
 of the Mid-West

Authorized Signature

PRESIDENT

Dean Leonardo, Kent Regional Office, 101 Waters Bldg., 616-451-3591

ksk 320  
 41-002-003 AMENDED 10-84

NOTE: The reverse side hereof is part of this commitment.

9. Land Contract vendee's interest of James Heyboer and Richard Bolt as recorded in Liber 2380 of Deeds, Page 416, Kent County Records.

TAX INFORMATION NOTE:

PERMANENT PARCEL NUMBER: 41-13-25-462-002

STATE EQUALIZED VALUE: \$44,500.00

1988 Summer Taxes are paid in the amount of \$2,339.76

1988 Winter Taxes are paid in the amount of \$212.00

---

LEGAL DESCRIPTION

Lots 10 and 11, Block 11, Ellsworth Addition and the West 1/2 of the vacated alley adjacent on the East, according to the recorded plat thereof. Except Parcel A described as: Part of Lot 11, Block 11, Ellsworth's Addition to the City of Grand Rapids, Kent County, Michigan (as recorded in Liber 1, Page 25, Kent County Plats) described as beginning at a point on the South line of Lot 11, distant South 88 degrees 18 minutes 49 seconds East 93.89 feet from the Southwest corner of Lot 11 and proceeding thence North 00 degrees 08 minutes 10 seconds West 30.30 feet along the West side of the Westerly wall of a concrete block building attached to and part of 324 Ellsworth Ave. S.W.; thence South 88 degrees 25 minutes 45 seconds East 54.67 feet along the South side of the South wall and the extension thereof of building #318 Ellsworth Ave. S.W., to the East line of the West 1/2 of the vacated alley adjacent to the East side of Lot 11; thence South 0 degrees 01 minutes 34 seconds East 30.41 feet along the East line of the West 1/2 of said vacated alley to the South line of Lot 11 extended Eastward; thence North 88 degrees 18 minutes 49 seconds West 54.61 feet along the South line of Lot 11 and the extension thereof to the point of beginning,

C

Date: 11/08/88  
Revision: 88-0  
Page: C-1

## SECTION C

### WASTE CHARACTERISTICS

TABLE OF CONTENTS

Page

SECTION C  
WASTE CHARACTERISTICS

C-1	CHEMICAL AND PHYSICAL ANALYSES	
	[40 CFR §270.14(b)(2), §264.13(a)]	C-5
C-2	WASTE ANALYSIS PLAN [40 CFR §270.14(b)(3), §264.13(b),(c)]	C-7
C-2a	Parameters and Rationale [40 CFR §264.13(b)(1)]	C-7
C-2b	Test Methods [40 CFR §264.13(b)(2), §264.13(c)(1)]	C-7
C-2c	Sampling Methods [40 CFR §264.13(b)(3), §264.13(c)(2)]	C-7
C-2d	Frequency of Analysis [264.13(b)(4)]	C-9
C-2e	Additional Requirements for Ignitable, Reactive Incompatible Wastes [40 CFR §264.13(b)(6), §264.17]	C-9

Date: 11/08/88  
Revision: 88-0  
Page: C-3

LIST OF TABLES

		<u>Page</u>
TABLE C-1	LIST OF HAZARDOUS WASTES	C-6
TABLE C-2	PARAMETERS AND RATIONALE	C-8

LIST OF ATTACHMENTS

ATTACHMENT C-1	MATERIAL SAFETY DATA SHEETS
ATTACHMENT C-2	SOLVENT CONTENT AND COMPOSITE SAMPLING PROCEDURES

Date: 11/08/88

Revision: 88-0

Page: C-4

## SECTION C

### WASTE CHARACTERISTICS

This section provides a description of the chemical and physical nature of the hazardous wastes managed in the container storage area at the Detrex Corporation Gold Shield Solvents facility located in Grand Rapids, Michigan.

Gold Shield Solvents in Grand Rapids, Michigan typically receives drummed halogenated hydrocarbon solvent wastes generated from degreasing and other cleaning operations for reclamation (recycling) at an off-site Detrex Gold Shield Solvents facility or for treatment/disposal at an off-site permitted facility. Gold Shield Solvents also sells virgin solvents, consequently, personnel are familiar with the wastes that are received at the facility.

The information is provided pursuant to Michigan Act 64 Rule 299.9504(1)(c) which incorporates 40 CFR 270.14(b)(2) and (3) by reference. The applicable section(s) of the Federal Regulations (40 CFR) is referenced as appropriate.



C-1 CHEMICAL AND PHYSICAL ANALYSES  
[40 CFR §270.14(b)(2), §264.13(a)]

Provided in Table C-1 is a list of all hazardous wastes which may be received and stored in the container storage area. In addition to the list of wastes which may be stored at the facility, Table C-1 also provides, for each waste, its EPA hazardous waste identification number, the hazardous constituent/characteristic which designates the waste as hazardous, and the waste's physical state.

Provided as Attachment C-1 to this application are representative Material Safety Data Sheets for each of the hazardous wastes listed in Table C-1. These sheets describe in detail the chemical and physical properties of each waste managed at Gold Shield Solvents to allow their safe handling in accordance with 40 CFR Part 264.

All drummed hazardous wastes stored at the facility are properly labeled to identify the drums contents. This allows personnel to easily identify each drum and to handle it in the appropriate manner.

If analytical results reveal that a customer has shipped an unauthorized drum or drums to the Gold Shield Solvents facility, the customer will be notified immediately and appropriate arrangements made to return the drum(s) or transport it to an authorized treatment or disposal facility. Unauthorized drums will not be accepted by Gold Shield Solvents.

Hazardous wastes are received at the Gold Shield Solvents facility in 55-gallon drums. Drums are stored in a container storage area located within the facility before being transported off site. The hazardous waste container storage area is described in detail in Section D of this operating license application.

C-1a Containerized Waste [40 CFR §270.10(b)(1)]

Hazardous solvent wastes are received in 55-gallon drums. The drums are stored within a container storage area located within a totally enclosed building. Adequate secondary containment is provided by the building's basement. Details of the containers, the container storage area and the secondary containment area are provided in Section D of this permit application.

TABLE C-1  
LIST OF HAZARDOUS WASTES

Hazardous Waste	EPA Hazardous Waste Number	Hazardous Constituent/Characteristic	EPA Process Code	Physical State
1,1,1 Trichloroethane	F001	Toxic	S01	Liquid
Trichloroethylene	F001	Toxic	S01	Liquid
Methylene Chloride	F001	Toxic	S01	Liquid
Perchloroethylene	F001	Toxic	S01	Liquid
Trichlorotrifluoroethane (Freon)	F001	Toxic	S01	Liquid
1,1,1 Trichloroethane	F002	Toxic	S01	Sludge *
Trichloroethylene	F002	Toxic	S01	Sludge *
Methylene Chloride	F002	Toxic	S01	Sludge *
perchloroethylene	F002	Toxic	S01	Sludge *
Trichlorotrifluoroethane (Freon)	F002	Toxic	S01	Sludge *

Notes:

\* - Represents a waste stream that has been partially distilled at the customers degreasing operation facility.

C-1b Waste in Tanks [40 CFR §264.191]

Hazardous wastes are not and never have been stored in storage tanks at the Detrex Gold Shield Solvents facility in Grand Rapids, Michigan; hence, a permit for a storage tank is not requested.

C-1c Waste in Piles [40 CFR §264.250(c)(1)]

Hazardous wastes are not and never have been stored in waste piles at the Detrex Gold Shield Solvents facility in Grand Rapids, Michigan; hence, a permit for waste piles is not requested.

C-1d Landfilled Wastes [40 CFR §264.314]

Hazardous wastes are not and never have been landfilled at the Detrex Gold Shield Solvents facility in Grand Rapids, Michigan; hence, a permit for a landfill is not requested.

C-1e Wastes Incinerated and Wastes  
Used in Performance Tests  
[40 CFR §270.62(2)(ii)(A)]

Hazardous wastes are not and never have been burned at the Detrex Gold Shield Solvents facility in Grand Rapids, Michigan; hence, a permit for an incinerator is not requested.

C-1f Wastes to be Land Treated  
[40 CFR §270.20(b)(4), 264.271(a)(2)]

Hazardous wastes are not and never have been land treated at the Detrex Gold Shield Solvents facility in Grand Rapids, Michigan; hence, a permit for a land treatment is not requested.

**C-2 WASTE ANALYSIS PLAN [40 CFR §270.14(b)(3), §264.13(b),(c)]**

**C-2a Parameters and Rationale [40 CFR §264.13(b)(1)]**

Table C-2 lists the hazardous wastes which may be received and stored at the Gold Shield Solvents facility, the analytical parameters that apply to each waste and the rationale for their selection.

Gold Shield Solvents specializes in the sale of halogenated solvents, cleaning equipment for degreasing operations, and the collection of solvent wastes generated in degreasing and other cleaning operations. All wastes accepted at the Gold Shield Solvents facility for the recycling operation are classified as F001 or F002 hazardous waste under 40 CFR Part 261. As such, all wastes accepted at the facility are restricted wastes pursuant to 40 CFR 268. The wastes may not meet the applicable treatment standards set forth in 40 CFR §268 Subpart D. Therefore, wastes that do not meet the applicable treatment standards are required to be accompanied by notifications required under 40 CFR §268.7 during shipment to and from the facility. Gold Shield Solvents utilizes knowledge of the waste to determine if such wastes exceed applicable treatment standards.

Incoming wastes are analyzed for halogenated volatile organic parameters and solvent content, as discussed in Section C-2d, to ensure that the waste is properly manifested, labeled and stored, prior to shipment off site.

**C-2b Test Methods [40 CFR §264.13(b)(2), §264.13(c)(1)]**

The solvent wastes are analyzed for the halogenated volatile organics according SW-846 Method 8010 (SW-846-Test Methods for Evaluating Solid Waste, Physical/Chemical Methods, 2nd Ed.).

The solvent content of the wastes is determined using a specific gravity method developed by Gold Shield Solvents. The procedure for this method is presented in Attachment C-2.

**C-2c Sampling Method [40 CFR §264.13(b)(3), §264.13(c)(2)]**

The following procedure shall be adhered to during sampling of drummed waste.

1. Remove bung.
2. Insert glass thief (or alternate device) to the bottom of the drum.
3. Allow the waste in the drum to reach its natural level in the tube.

TABLE C-2

PARAMETERS AND RATIONALE FOR THEIR SELECTION

<u>Hazardous Waste</u>	<u>Parameter</u>	<u>Rationale*</u>
F001	1,1,1 Trichloroethane Trichloroethylene Methylene Chloride Perchloroethylene Trichlorotrifluoroethane	Listed toxic waste (F001)
	Solvent Content (%)	Process knowledge
F002	1,1,1 Trichloroethane Trichloroethylene Methylene Chloride Perchloroethylene Trichlorotrifluoroethane	Listed toxic waste (F002)
	Solvent Content (%)	Process knowledge

NOTE: \*There is no reason to believe that these wastes will contain any other toxic constituents in significant concentration.

4. Cap the top of the sampling tube with gloved thumb.
5. Carefully remove the tube from the drum and insert the uncapped end in a graduated beaker.
6. Release the thumb and allow glass thief to drain completely into the beaker.
7. Pour waste sample directly from beaker to sample container or to graduated cylinder for composite samples.
8. Remove tube from the sample container.
9. Replace the bung.

C-2d Frequency of Analysis [264.13(b)(4)]

C-2d(1) New Customer Procedure

Before any hazardous waste material is accepted from a new customer for shipment to the Gold Shield Solvents facility in Grand Rapids, the waste is sampled and assessed to ensure its characterization is acceptable to the off-site Gold Shield Solvents recovery (recycling) operation. In addition to sampling, an effort is made to document the generation process of the waste to further characterize its composition.

The waste is sampled as per the sampling method presented in Section C-2c. A preliminary assessment of the waste sample will be made by running a specific gravity test to determine the approximate solvent content. The sample is then sent to the Detrex Corporation laboratory in either Detroit, Michigan or Ashtabula, Ohio for further analysis. Analytical procedures were described in Section C-2b of this permit application.

Regardless of whether or not Detrex accepts the waste, all of the foregoing knowledge, including laboratory results, is kept in the customer's file for future reference and comparison with future shipments, if they become a regular customer.

C-2d(2) Existing (Regular) Customer Procedure

For regular customers, Detrex generally picks up the waste drums with its own truck. This allows the driver to inspect the drums prior to delivering them to the Gold Shields Solvents facility to ensure they are properly labeled, manifested and accompanied by proper notification, if necessary, and that the drums are in good condition for shipping. Drum condition requirements prior to acceptance are described in Section D-1a(1).

Date: 11/08/88  
Revision: 88-0  
Page: C-11

Upon receipt at the Gold Shield Solvents facility, each drum is sampled in accordance with the sampling method described in Section C-2c. The sample is analyzed for specific gravity to determine the solvent content of the drum and then a sample is sent to the Detrex Corporation laboratory in either Detroit, Michigan or Ashtabula, Ohio. In addition, during sampling, observations are made and recorded pertaining to abnormal solid content, an odor that is not a halogenated solvent characteristic odor, or is it an aqueous solvent rather than an oil/solvent mixture.

The difference between waste analysis for regular customers versus new customers is that if a regular customer sends a large number of drums to the facility, a composite sample may be collected as described in Attachment C-2. In the event that a discrepancy is found during a composite waste analysis, each individual drum in the lot will be sampled to determine which drum(s) is improperly classified.

C-2e Additional Requirements for Ignitable, Reactive or Incompatible Wastes [40 CFR §264.13(b)(6), §264.17]

Gold Shield Solvents facility does accept ignitable, reactive or incompatible waste at the hazardous waste container storage area; hence, the additional waste analysis requirements are not applicable.





ATTACHMENT C-1

MATERIAL SAFETY DATA SHEETS

# Material Safety Data Sheet

MSD 8208.20

DETREX CHEMICAL INDUSTRIES, INC.  
P.O. BOX 501  
DETROIT, MICHIGAN 48232



Approved by U.S. Dept. of Labor as "Essentially similar" to Form OSHA-20

Date: August, 1982	Edition: First
Chemical Name and Synonyms: 1,1,1-trichloroethane; methylchloroform CAS No. 71-55-6	Trade Name and Synonyms: PERM-ETHANE ® DG
Chemical Family: Halogenated Hydrocarbons	Formula: $\text{CH}_3\text{CCl}_3$
DOT Shipping Name: 1,1,1-trichloroethane	DOT Hazard Class: ORM-A
	I. D. Number: UN 2831

## SECTION 1 • PHYSICAL DATA

Boiling Point @ 760 mm Hg: 165.4°F	Vapor Density (Air=1): 4.54	Specific Gravity ( $\text{H}_2\text{O}=1$ ): 1.300-1.320 @ 25°/25°C	pH of Solutions: 6.0 to 7.5
Freezing/Melting Point: -49°F -45°C	Solubility (Weight % in Water): Negligible	Bulk Density: 10.80-10.97 lbs/gal @ 25°C	Volume % Volatile: Essentially 100
Vapor Pressure: @ 25°C = 135mmHg	Evaporation Rate (ethyl ether = 1): 0.35	Heat of Solution: Not Applicable	Appearance and Odor: Clear, colorless liquid - ether-like odor.

## SECTION 2 • HAZARDOUS INGREDIENTS

	%	Hazard Data
1,1,1-trichloroethane (Stabilized)	100	See Sections 4 & 5

## SECTION 3 • FIRE AND EXPLOSION HAZARD DATA

Flash Point °F (Method Used) None when tested in accordance with DOT requirements.	Flammable Limits in Air (% by Volume) LEL: 7% UEL: 15% See Below	Extinguishing Media: water, dry chemical or carbon dioxide
---	--	---

Special Fire Fighting Procedures: Fire fighters should wear a NIOSH/MSHA-approved pressure-demand, self-contained breathing apparatus for possible exposure to hydrogen chloride and possibly traces of phosgene. Use water only in degreasers when aluminum reaction occurs.

Unusual Fire and Explosion Hazards: Vapors concentrated in a confined or poorly ventilated area can be ignited upon contact with a spark, flame, or high intensity source of heat. This can occur at concentrations ranging between 7-15% by volume. Decomposition or burning can produce hydrogen chloride or possibly traces of phosgene. Also see Detrex warning letter Form SoL 8208.21 attached.

## SECTION 4 • HEALTH HAZARD DATA

Toxicity Data	Classification (Poison, Irritant, Etc.)
LC <sub>50</sub> Inhalation (rat) 8,000 ppm/7 hours	Inhalation: Toxic
LD <sub>50</sub> Dermal (rabbit) 15g/kg <sup>(2)</sup>	Skin/Eye: Liquid mildly irritating to skin; eye irritant
LD <sub>50</sub> Ingestion (rat) 10-12g/kg (See Section 5)	Ingestion: Not significantly toxic
Fish, LC <sub>50</sub> (Lethal Concentration) Not Determined	Aquatic:

Human Exposure Information/Data:

**24-HOUR EMERGENCY ASSISTANCE: (313) 358-5800**

---

## SECTION 5 • EFFECTS OF OVEREXPOSURE

---

This section covers effects of overexposure for inhalation, eye/skin contact, ingestion and other types of overexposure formation in the order of the most hazardous and the most likely route of overexposure.

---

Permissible Exposure Limits (TLV):

350 ppm - 8-hour time-weighted average (TWA) - OSHA 29CFR 1910.1000 (May 28, 1975).

### Acute

Primarily a central nervous system depressant. Inhalation can cause irritation of the respiratory system, dizziness, nausea, lightheadedness, headache, loss of coordination and equilibrium, unconsciousness and, if exposed to high concentrations in confined or poorly ventilated areas, even death. Depression of the circulatory system has been reported as a result of overexposure to 1,1,1-trichloroethane. The heart may be sensitized by overexposure and ventricular arrhythmia may be induced by epinephrine administration.

Liquid splashed in the eyes can result in discomfort, pain and irritation. Prolonged or repeated contact with liquid on the skin can cause irritation and dermatitis. The problem may be accentuated by liquid becoming trapped against the skin by contaminated clothing and shoes. Skin absorption can occur.

### Chronic

Prolonged exposure above the OSHA permissible exposure limits may result in liver and kidney damage. 1,1,1-trichloroethane has been extensively studied for cancer both in the U.S. and Europe by government, industry and academia. There is no documented evidence that 1,1,1-trichloroethane causes an increased cancer incidence in humans.

## EMERGENCY AND FIRST AID PROCEDURES:

**Inhalation:** Remove to fresh air. If not breathing, give artificial respiration, preferably mouth-to-mouth. If breathing is difficult, give oxygen. Call a physician.

**Eye or Skin Contact:** Flush eyes and skin with plenty of water (soap and water for skin) for at least 15 minutes, while removing contaminated clothing and shoes. If irritation occurs, consult a physician.

**Ingestion:** If conscious, drink large quantities of water, DO NOT induce vomiting. Take immediately to a hospital or physician. If unconscious, or in convulsions, take immediately to a hospital. DO NOT give anything by mouth to an unconscious person.

**Notes to Physician (Including Antidotes):** NEVER administer adrenalin following 1,1,1-trichloroethane overexposure. Increased sensitivity of the heart to adrenalin may be caused by overexposure to 1,1,1-trichloroethane.

## SECTION 6 . REACTIVITY DATA

<b>Stability:</b> Stable	<b>Conditions to Avoid:</b> Avoid open flames, hot glowing surfaces or electric arcs.
<b>Hazardous Polymerization:</b> Will not occur.	<b>Conditions to Avoid:</b> None

### **Incompatibility (Materials to Avoid):**

Avoid contamination with caustic soda, caustic potash or oxidizing materials. Shock sensitive explosives may be formed. Avoid contact with aluminum, magnesium, zinc and alloys thereof under high pressures. See Detrex warning letter Form SoL 8208.21 attached.

### **Hazardous Decomposition Products:**

Hydrogen chloride and possibly traces of phosgene.

## SECTION 7 . SPILL OR LEAK PROCEDURES (See Detrex Forms SoL 8208.14 and SoL 8208.15 attached)

**Steps to be Taken if Material is Spilled or Released:** Immediately evacuate the area and provide maximum ventilation. Unprotected personnel should move upwind of spill. Only personnel equipped with proper respiratory and skin/eye protection should be permitted in area. Dike area to contain spill. Take precautions as necessary to prevent contamination of ground and surface waters. Recover or absorb spilled material on sawdust or vermiculite and sweep into closed containers for disposal. After all visible traces have been removed, thoroughly wet vacuum the area. DO NOT flush to sewer. If area of spill is porous, remove as much contaminated earth and gravel, etc., as necessary and place in closed containers for disposal. (See Below)

**Waste Disposal Method:** Contaminated sawdust, vermiculite or porous surface must be disposed of in a permitted hazardous waste management facility. Recovered liquids may be re-processed or incinerated or must be treated in a permitted hazardous waste management facility. Care must be taken when using or disposing of chemical materials and/or their containers to prevent environmental contamination. It is your duty to dispose of the chemical materials and/or their containers in accordance with the Clean Air Act, the Clean Water Act, the Resource Conservation and Recovery Act as well as any other relevant federal, state or local laws/regulations regarding disposal.

## SECTION 8 • SPECIAL PROTECTION INFORMATION

**Respiratory Protection:** For emergencies or working in confined areas, wear self-contained breathing apparatus or supplied air respiratory protection (use the "buddy system" and wear a safety harness with a lifeline). In other circumstances involving potential overexposure, use NIOSH/MSHA-approved organic vapor respirator. (Observe limitations directed by manufacturer.) Respiratory protection program must be in accordance with 29CFR 1910.134.

**Ventilation (Type):** Dilution (General) or Local Exhaust - Sufficient to maintain workplace concentration below permissible exposure limits.

**Eye Protection:** Splashproof Goggles      **Gloves:** polyethylene, neoprene or polyvinyl alcohol

**Other Protective Equipment:** Safety shower and eye-wash fountain in immediate area. Personnel protective clothing and use of equipment must be in accordance with 29CFR 1910.133 and 29CFR 1910.132.

## SECTION 9 • SPECIAL PRECAUTIONS

### Precautions to be Taken During Handling and Storing:

- Do not use in poorly ventilated or confined areas.
- 1,1,1-trichloroethane vapors are heavier than air and will collect in low areas.
- Keep container closed when not in use.
- Do not store in open, unlabeled or mislabeled containers.
- Liquid oxygen or other strong oxidants may form explosive mixtures with 1,1,1-trichloroethane.
- This material or its vapors when in contact with flames, hot glowing surfaces or electric arcs can decompose to form hydrogen chloride gas and traces of phosgene.
- AVOID CONTAMINATION OF WATER SUPPLIES: Handling, storage, and use procedures must be carefully monitored to avoid spills or leaks. Any spill or leak has the potential to cause underground water contamination which may, if sufficiently severe, render a drinking water source unfit for human consumption. Contamination that does occur cannot be easily corrected.
- A chlorinated solvent used as a flashpoint suppressant must be added in sufficient quantity or the resultant mixture may have a flashpoint lower than the flammable component.
- Caution should be taken not to use in pressurized or totally enclosed system of light metal construction such as aluminum, magnesium, zinc or alloys thereof. Example, paint or adhesive spray system. (See Detrex Form SoL 8208.21 attached.)

### Other Precautions:

- AVOID PROLONGED OR REPEATED BREATHING OF VAPORS. High vapor concentrations can cause dizziness, unconsciousness or death. Long-term overexposure may cause liver/kidney injury.
- USE ONLY WITH ADEQUATE VENTILATION. Ventilation must be sufficient to limit employee exposure to 1,1,1-trichloroethane below OSHA permissible limits (8-hour TWA 350 ppm). Observance of lower limits (outlined in Section 4) is advisable.
- AVOID CONTACT WITH EYES. Will cause irritation and pain.
- AVOID PROLONGED OR REPEATED CONTACT WITH SKIN. May cause irritation or dermatitis.
- DO NOT TAKE INTERNALLY. Swallowing may cause injury or death.
- DO NOT EAT, DRINK, OR SMOKE IN WORK AREAS.

### References:

1. NIOSH Registry of Toxic Effects of Chemical Substances, 1978
2. Industrial Hygiene and Toxicology, Volume II, Second Edition, F.A. Patty, 1963
3. Dangerous Properties of Industrial Materials, Fifth Edition, N.I. Sax, 1979
4. Industrial Toxicology, Hamilton and Hardy, 1974
5. Toxicity and Metabolisms of Industry Solvents, Browning, 1965
6. Toxicology, the Basic Science of Poisons, Casarett and Doull, 1980
7. Federal Register, 45FR Hazardous Waste Management Systems Part III, Identification and Listing of Hazardous Wastes, Page 33084, May 19, 1980
8. EPA Science Advisory Board, Subcommittee on Airborne Carcinogens, September, 1980

### Comments:

As this solvent (1,1,1-trichloroethane) is used to clean and/or degrease a wide variety of metal and plastic parts, it should always be used in conjunction with properly designed and fully controlled degreasing equipment that is in compliance with the U.S. Environmental Protection Agency, OAQPS Guidelines, "Control of Volatile Organic Emissions from Solvent Metal Cleaning", and/or all other applicable federal, state and local regulatory guidelines.

# Material Safety Data Sheet

MSD 8208.19

DETREX CHEMICAL INDUSTRIES, INC.  
P.O. BOX 501,  
DETROIT, MICHIGAN 48232



Approved by U.S. Dept. of Labor as "Essentially similar" to Form OSHA-20

Date: August, 1982	Edition: First
Chemical Name and Synonyms: Trichloroethylene; trichloroethene CAS No.: 79-01-6	Trade Name and Synonyms: PERM-A-CLOR® NA, Trichlor, Trichlorethylene
Chemical Family: Halogenated Hydrocarbons	Formula: $\text{CHCl} = \text{CCl}_2$
DOT Shipping Name: trichloroethylene	DOT Hazard Class: ORM-A UN1710 (RQ 1000#/454kg)

## SECTION 1 • PHYSICAL DATA

Boiling Point @ 760 mm Hg: 188°F	Vapor Density (Air=1): 4.54	Specific Gravity ( $\text{H}_2\text{O}=1$ ): (20°/20°C) 1.465	pH of Solutions: 6.7 to 7.5
Freezing/Melting Point: -123.5°F -86.4°C	Solubility (Weight % in Water): 0.11 @ 25°C	Bulk Density: @ 20°C 12.2 lbs./gal.	Volume % Volatile: Essentially 100
Vapor Pressure: @ 20°C = 57.8mmHg	Evaporation Rate (ethyl ether=1): 0.28	Heat of Solution: Not Applicable	Appearance and Odor: Clear, colorless liquid with ether-like odor.

## SECTION 2 • HAZARDOUS INGREDIENTS

	%	Hazard Data
Trichloroethylene (Stabilized)	100	See Sections 4 and 5

## SECTION 3 • FIRE AND EXPLOSION HAZARD DATA

Flash Point °F (Method Used) None when tested in accordance with DOT requirements. (See Below)	Flammable Limits in Air (% by Volume) See Below LEL: 12.5% UEL: 90%	Extinguishing Media: Water, dry chemicals or carbon dioxide.
--	---	---

Special Fire Fighting Procedures: Fire fighters should wear NIOSH/MSHA pressure-demand, self-contained breathing apparatus for possible exposure to hydrogen chloride and possibly traces of phosgene.

Unusual Fire and Explosion Hazards: Vapors concentrated in a confined or poorly ventilated area can be ignited upon contact with a spark, flame or high-intensity source of heat. This can occur at concentrations of approximately 12.5% and above by volume. Decomposition or burning can produce hydrogen chloride and possibly traces of phosgene.

Also see Detrex warning letter Form SoL 8208.21 attached.

## SECTION 4 • HEALTH HAZARD DATA

Permissible Exposure Limits (TLV): See Section 5

Toxicity Data Ref. (1), (2)	Classification (Poison, Irritant, Etc.)
LCLoInhalation (rat) - 8,000 ppm/4 hour	Inhalation: Toxic
LD <sub>50</sub> Dermal	Skin/Eye: Liquid mildly irritant to skin; eye irritant.
LD <sub>50</sub> Ingestion (rat) - 4,900 - 7,000 mg/kg	Ingestion: Slightly to moderately toxic
Fish, LC <sub>50</sub> (Lethal Concentration) Not Determined	Aquatic:

Human Exposure Information/Data: Unconfirmed data exists which indicate that trichloroethylene by ingestion may be more toxic to humans than indicated by the available animal data. Such unconfirmed data report poisonings at doses as low as 50 mg/kg.

**24-HOUR EMERGENCY ASSISTANCE: (313) 358-5800**

#### Section 4 (Cont'd) - Permissible Exposure Limits

Current OSHA permissible exposure limits (29CFR 1910.1000) are 100 ppm (8-hour TWA);  
100-200 ppm periodic excursions are allowed providing 8-hour TWA is at or below 100 ppm;  
200-300 ppm excursions allowed only for maximum of 5 minutes in any 2-hour period;  
300 ppm maximum allowable concentration (must not be exceeded).

---

### **SECTION 5 - EFFECTS OF OVEREXPOSURE**

---

This section covers effects of overexposure for inhalation, eye/skin contact, ingestion and other types of overexposure information in the order of the most hazardous and the most likely route of overexposure.

---

**Acute:** Irritant and central nervous system depressant. Inhalation can cause irritation of the respiratory tract, dizziness, nausea, headache, loss of coordination and equilibrium, unconsciousness and, if exposed at high concentrations in confined or poorly ventilated areas, even death. Fatalities following severe acute exposure at high concentrations have been attributed to ventricular fibrillation resulting in cardiac failures.<sup>3</sup>

Liquid splashed in the eye can result in discomfort, pain and irritation. Prolonged or repeated contact with liquid on the skin can cause irritation and dermatitis. The problem may be accentuated by liquid becoming trapped against the skin by contaminated clothing and shoes. Skin absorption can occur.

**Chronic:** Prolonged exposure above the OSHA permissible exposure limits may result in liver and kidney damage. Trichloroethylene has been extensively studied for cancer both in the U.S. and Europe by government, industry and academia. There is no documented evidence that Trichloroethylene causes an increased cancer incidence in humans.

## EMERGENCY AND FIRST AID PROCEDURES:

**Inhalation:** Remove to fresh air. If not breathing, give artificial respiration, preferably mouth-to-mouth. If breathing is difficult, give oxygen. Call a physician.

**Eye or Skin Contact:** Flush eyes and skin with plenty of water (soap and water for skin) for at least 15 minutes, while removing contaminated clothing and shoes. If irritation occurs, consult a physician.

**Ingestion:** If conscious, drink a quart of water. DO NOT induce vomiting. Take immediately to a hospital or physician. If unconscious, or in convulsions, take immediately to a hospital or physician. DO NOT give anything by mouth to an unconscious person.

**Notes to Physician (Including Antidotes):** NEVER administer adrenalin following trichloroethylene overexposure. Increased sensitivity of the heart to adrenalin may be caused by overexposure to trichloroethylene.

## SECTION 6 . REACTIVITY DATA

<b>Stability:</b> Stable	<b>Conditions to Avoid:</b> Avoid open flames, hot glowing surfaces or electric arcs.
<b>Hazardous Polymerization:</b> Will not occur	<b>Conditions to Avoid:</b> None

**Incompatibility (Materials to Avoid):** Avoid contamination with caustic soda, caustic potash or oxidizing materials. Shock sensitive explosives may be formed.  
See Detrex warning letter Form SoL 8208.21 attached.

**Hazardous Decomposition Products:** Hydrogen chloride and possibly traces of phosgene.

## SECTION 7 . SPILL OR LEAK PROCEDURES (See Detrex Forms SoL 8208.14 and SoL 8208.15 attached)

**Steps to be Taken if Material is Spilled or Released:** Immediately evacuate the area and provide maximum ventilation. Unprotected personnel should move upwind of spill. Only personnel equipped with proper respiratory and skin/eye protection should be permitted in area. Dike area to contain spill. Take precautions as necessary to prevent contamination of ground and surface waters. Recover or absorb spilled material on sawdust or vermiculite and sweep into closed containers for disposal. After all visible traces have been removed, thoroughly wet vacuum the area. DO NOT flush to sewer. If area of spill is porous, remove as much contaminated earth and gravel, etc., as necessary and place in closed containers for disposal. (See Below)

**Waste Disposal Method:** Contaminated sawdust, vermiculite or porous surface must be disposed of in a permitted hazardous waste management facility. Recovered liquids may be reprocessed or incinerated or must be treated in a permitted hazardous waste management facility.<sup>7</sup> Care must be taken when using or disposing of chemical materials and/or their containers to prevent environmental contamination. It is your duty to dispose of the chemical materials and/or their containers in accordance with the Clean Air Act, the Clean Water Act, the Resource Conservation and Recovery Act and all relevant state or local laws/regulations regarding disposal of hazardous waste.



---

## SECTION 8 • SPECIAL PROTECTION INFORMATION

---

**Respiratory Protection:** For emergencies or working in confined areas, wear self-contained breathing apparatus or supplied air respiratory protection (use "buddy system", also use harness and lifeline). In other circumstances involving potential overexposures, use NIOSH/MSHA-approved organic vapor respirator. (Observe limitations directed by manufacturer.) Respiratory protection program must be in accordance with 29CFR 1910.134.

**Ventilation (Type):** Mechanical (General) - Sufficient to maintain workplace concentration below permissible exposure limits.

**Eye Protection:** Splashproof goggles.

**Gloves:** Polyethylene, neoprene or polyvinyl alcohol.

**Other Protective Equipment:** Safety shower and eye-wash fountain in immediate area. Personnel protective clothing and use of equipment must be in accordance with 29CFR 1910.133 and 29CFR 1910.132.

---

## SECTION 9 • SPECIAL PRECAUTIONS

---

### Precautions to be Taken During Handling and Storing:

- Do not use in poorly ventilated or confined spaces.
- Trichloroethylene vapors are heavier than air and will collect in low areas. Keep container closed when not in use.
- Do not store in open, unlabeled or mislabeled containers.
- Liquid oxygen or other strong oxidants may form explosive mixtures with trichloroethylene.
- This material or its vapors when in contact with flames, hot glowing surfaces or electric arcs can decompose to form hydrogen chloride gas and traces of phosgene.
- AVOID CONTAMINATION OF WATER SUPPLIES: Handling, storage and use procedures must be carefully monitored to avoid spills or leaks. Any spill or leak has the potential to cause underground water contamination which may, if sufficiently severe, render a drinking water source unfit for human consumption. Contamination that does occur cannot be easily corrected.

### Other Precautions:

- AVOID PROLONGED OR REPEATED BREATHING OF VAPORS. High vapor concentrations can cause dizziness, unconsciousness or death. Long term overexposure may cause liver/kidney injury.
- USE ONLY WITH ADEQUATE VENTILATION. Ventilation must be sufficient to limit employee exposure to trichloroethylene in work area at or below OSHA permissible exposure limits (8-hour TWA - 100 ppm; ceiling - 200 ppm; maximum peak - 300 ppm, 5 minutes in every 2 hours). Observance of lower limits (outlined in Section 4) is advisable.
- AVOID CONTACT WITH EYES. Will cause irritation and pain.
- AVOID PROLONGED OR REPEATED CONTACT WITH SKIN. May cause irritation or dermatitis.
- DO NOT TAKE INTERNALLY. Swallowing may cause injury or death.
- DO NOT EAT, DRINK OR SMOKE IN WORK AREAS.

---

## References:

1. NIOSH Registry of Toxic Effects of Chemical Substances, 1978
2. Industrial Hygiene and Toxicology, Volume II, Second Edition, F. A. Patty, 1963
3. Dangerous Properties of Industrial Materials, Fifth Edition, N. I. Sax, 1979
4. Industrial Toxicology, Hamilton and Hardy, 1974
5. Toxicity and Metabolisms of Industrial Solvents, Browning, 1965
6. Toxicology, the Basic Science of Poisons, Casarett and Doull, 1975
7. Federal Register, 45FR Hazardous Waste Management Systems Part III, Identification and Listing of Hazardous Wastes, Page 33084, May 19, 1980
8. EPA Science Advisory Board, Subcommittee on Airborne Carcinogens, September, 1980

---

## Comments:

As this solvent (trichloroethylene) is used primarily to clean and/or degrease a wide variety of metal and plastic parts, it should always be used in conjunction with properly designed and fully controlled solvent vapor degreasing equipment that is in compliance with the U.S. Environmental Protection Agency, OAQPS Guidelines, "Control of Volatile Organic Emissions from Solvent Metal Cleaning", and/or all other applicable federal, state or local regulatory guidelines.

# Material Safety Data Sheet

MSD 8208.23

DETREX CHEMICAL INDUSTRIES, INC.  
P.O. BOX 501,  
DETROIT, MICHIGAN 48232



Approved by U.S. Dept. of Labor as "Essentially similar" to Form OSHA-20

Date:	Edition:
Chemical Name and Synonyms: Methylene Chloride; dichloromethane CAS No.: 75-09-2	Trade Name and Synonyms: Methylene Chloride
Chemical Family: Halogenated Hydrocarbons	Formula: CH <sub>2</sub> Cl <sub>2</sub>
DOT Shipping Name: Methylene Chloride	DOT Hazard Class: ORM-A - UN1593

## SECTION 1 - PHYSICAL DATA

Boiling Point @ 760 mm Hg: 103.6°F (39.8°C)	Vapor Density (Air=1): @ 20°C = 2.93	Specific Gravity (H <sub>2</sub> O=1): 1.32	pH of Solutions: Neutral
Freezing/Melting Point: -142.1°F (-96.7°C)	Solubility (Weight % in Water): 2g/100 ml	Bulk Density: @ 20°C 11.15 lbs./gal.	Volume % Volatile: Essentially 100
Vapor Pressure: @ 20°C = 349 mmHg	Evaporation Rate (ethyl ether = 1): 0.71	Heat of Solution: Not Applicable	Appearance and Odor: Clear, colorless liquid with ether-like odor.

## SECTION 2 - HAZARDOUS INGREDIENTS

	%	Hazard Data
Methylene Chloride (Stabilized)	100	See Sections 4 and 5

## SECTION 3 - FIRE AND EXPLOSION HAZARD DATA

Flash Point °F (Method Used) None when tested in accordance with DOT requirements.	Flammable Limits in Air (% by Volume) See Below LEL: 12% UEL: 19%	Extinguishing Media: For fires involving methylene chloride, use water, dry chemicals or CO <sub>2</sub> .
--	---	--

Special Fire Fighting Procedures: Fire fighters should wear NIOSH/MSHA-approved, self-contained breathing apparatus for possible exposure to hydrogen chloride and possible traces of phosgene.

Unusual Fire and Explosion Hazards: Vapors concentrated in a poorly ventilated area can be ignited upon contact with a spark, flame or high intensity source of heat. This can occur at concentrations between 12% and 19% by volume. Decomposition or burning can produce hydrogen chloride and possibly traces of phosgene. Also see Detrex warning letter Form Sol 8208.21 attached.

## SECTION 4 - HEALTH HAZARD DATA

Permissible Exposure Limits (TLV): 500ppm (TWA)	See Section 4 (Cont'd) next page
Toxicity Data	Classification (Poison, Irritant, Etc.)
LC <sub>50</sub> Inhalation LC <sub>50</sub> (guinea pig) 5,000ppm/2hrs. TCLO <sub>50</sub> (human) 500ppm/8hrs.	Inhalation: Toxic
LD <sub>50</sub> Dermal	Skin/Eye: Liquid mildly irritating to skin; eye irritant.
LD <sub>50</sub> Ingestion - (rat) - 2,136mg/kg	Ingestion: Slightly toxic
Fish. LC <sub>50</sub> (Lethal Concentration) Not determined	Aquatic:

Human Exposure Information/Data:

\* Lowest published toxic concentration.

**24-HOUR EMERGENCY ASSISTANCE: (313) 358-5800**

#### Section 4 (cont'd) - Permissible Exposure Limit

Current OSHA permissible exposure limits (29CFR 1910.1000) are 500 ppm (8-hour TWA); 500-1,000 ppm period excursions are allowed providing TWA is at or below 500 ppm; 1,000-2,000 ppm excursions allowed only for maximum of five minutes in any 2-hour period -- 2,000 ppm maximum allowable concentration (must not be exceeded).

\*NIOSH recommends that the TWA exposure limit for methylene chloride is 75 ppm. In the absence of occupational exposure to carbon monoxide (CO) above a TWA of 9 ppm up to a 10-hour workday, occupational exposure to methylene chloride shall be controlled so that workers are not exposed to methylene chloride in excess of 75 ppm (261 mg/cu m) determined as a TWA for up to a 10-hour workday, 40-hour workweek. In the presence of exposure to CO in the work environment at more than 9 ppm as a TWA for up to a 10-hour workday, exposure limits of CO or methylene or both shall be reduced to satisfy the relationship:

$$\frac{C(\text{CO})}{L(\text{CO})} + \frac{C(\text{CH}_2\text{Cl}_2)}{L(\text{CH}_2\text{Cl}_2)} \leq 1$$

where:  $C(\text{CO})$  = TWA exposure concentration of CO, ppm

$L(\text{CO})$  = the recommended TWA exposure limit of CO = 9 ppm

$C(\text{CH}_2\text{Cl}_2)$  = TWA exposure concentration of methylene chloride, ppm

$L(\text{CH}_2\text{Cl}_2)$  = the recommended TWA exposure limit of methylene chloride = 75 ppm

Occupational exposure shall be controlled so that workers are not exposed to methylene chloride above a peak concentration of 500 ppm (1,740 mg/cu m) as determined by a 15-minute sampling period.

Employees working with methylene chloride should be aware of this hazard. This toxic effect is "additive" in nature with the risk being greater for smokers, who generally have higher levels of carboxyhemoglobin. Employees with a history of cardiovascular disease should not be allowed to work with methylene chloride unless approved by a physician.

---

## **SECTION 5 - EFFECTS OF OVEREXPOSURE**

---

This section covers effects of overexposure for inhalation, eye/skin contact, ingestion and other types of overexposure in the order of the most hazardous and the most likely route of overexposure.

### Effects of Overexposure\*

**Acute:** Inhalation effect is primarily narcosis. Principal symptoms may be headache, dizziness, nausea, tingling or numbness of the extremities, senses of fullness in the head, sense of warmth, stupor or dullness, lethargy and drunkenness. Exposure to very high concentrations may lead to unconsciousness or even death in confined or poorly ventilated areas.

**Chronic:** Several chronic inhalation studies reported by NIOSH revealed that test animals exposed to methylene chloride concentrations as high as 10,000 ppm, showed slight liver and kidney changes. The results of these studies indicate that prolonged exposure limits may result in liver and kidney damage.

Chronic inhalation studies, cosponsored by several methylene chloride producers, were recently completed on rats. The results of these studies were reported to have revealed a mathematically significant increase in malignant salivary gland tumors in the group of male rats from the study's highest exposure level (3,500 ppm).

Liquid splashed in the eyes can result in discomfort, pain and irritation. Prolonged or repeated contact with liquid on the skin can cause irritation and dermatitis. The problem may be accentuated by liquid becoming trapped against the skin by contaminated clothing and shoes. Skin absorption can occur.

Research has recently shown that methylene chloride is metabolized by the body to carbon monoxide.<sup>4</sup> Further, the amount of carbon monoxide formed is directly related to the amount of methylene chloride absorbed and can be sufficient to produce a substantial stress on the cardiovascular system through the elevation of the level of carboxyhemoglobin (COHb) -- the product formed by the combination of carbon monoxide and the blood's hemoglobin thus effectively reducing the amount of hemoglobin available for the transport of oxygen throughout the body.

## EMERGENCY AND FIRST AID PROCEDURES:

**Inhalation:** Remove to fresh air. If not breathing, give artificial respiration, preferably mouth-to-mouth. If breathing is difficult, give oxygen. Call a physician.

**Eye or Skin Contact:** Flush eyes and skin with plenty of water (soap and water for skin) for at least 15 minutes, while removing contaminated clothing and shoes. If irritation occurs, consult a physician.

**Ingestion:** If conscious, drink a quart of water. DO NOT induce vomiting. Take immediately to a hospital or physician. If unconscious, or in convulsions, take immediately to a hospital or physician. DO NOT give anything by mouth to an unconscious person.

**Notes to Physician (Including Antidotes):** NEVER administer adrenalin following methylene chloride overexposure. Increased sensitivity of the heart to adrenalin may be caused by overexposure to methylene chloride.

## SECTION 6 - REACTIVITY DATA

<b>Stability:</b> Stable	<b>Conditions to Avoid:</b> Avoid open flames, hot glowing surfaces or electric arcs.
<b>Hazardous Polymerizations:</b> Will not occur	<b>Conditions to Avoid:</b> None

**Incompatibility (Materials to Avoid):** Avoid contamination with caustic soda, caustic potash or oxidizing materials. Shock sensitive explosives may be formed. Avoid contact with aluminum, magnesium, zinc and alloys thereof under high pressures. See Detrex warning letter Form Sol 8208.21 attached.

**Hazardous Decomposition Products:** Hydrogen chloride and possibly traces of phosgene.

## SECTION 7 - SPILL OR LEAK PROCEDURES (See Detrex Forms Sol 8208.14 and Sol 8208.15 attached)

**Steps to be Taken if Material is Spilled or Released:** Immediately evacuate the area and provide maximum ventilation. Unprotected personnel should move upwind of spill. Only personnel equipped with proper respiratory and skin/eye protection should be permitted in area. Dike area to contain spill. Take precautions as necessary to prevent contamination of ground and surface waters. Recover or absorb spilled material on sawdust or vermiculite and sweep into closed containers for disposal. After all visible traces have been removed, thoroughly wet vacuum the area. DO NOT flush to sewer. If area of spill is porous, remove as much contaminated earth and gravel, etc., as necessary and place in closed containers for disposal. (See Below).

**Waste Disposal Method:** Contaminated sawdust, vermiculite or porous surface must be disposed of in a permitted hazardous waste management facility. Recovered liquids may be reprocessed or incinerated or must be treated in a permitted hazardous waste management facility. Care must be taken when using or disposing of chemical materials and/or their containers to prevent environmental contamination. It is your duty to dispose of the chemical materials and/or their containers in accordance with the Clean Air Act, the Clean Water Act, the Resource Conservation and Recovery Act and all relevant state or local laws/regulations regarding disposal.

## SECTION 8 • SPECIAL PROTECTION INFORMATION

**Respiratory Protection:** For emergencies or working in confined areas, wear self-contained breathing apparatus or supplied air respiratory protection. (Use the "buddy system" and wear a safety harness with lifeline). In other circumstances involving potential overexposures, use NIOSH/MSHA-approved organic vapor respirator. (Observe limitations directed by manufacturer.) Respiratory protection program must be in accordance with 29CFR 1910.134.

**Ventilation (Type):** Mechanical (General) - Sufficient to maintain workplace concentration below permissible exposure limits.

**Eye Protection:** Splashproof goggles

**Gloves:** Polyethylene, neoprene or polyvinyl alcohol.

**Other Protective Equipment:** Safety shower and eye-wash fountain in immediate area. Personnel protective clothing and use of equipment must be in accordance with 29CFR 1910.133 and 29CFR 1910.132.

## SECTION 9 • SPECIAL PRECAUTIONS

### Precautions to be Taken During Handling and Storing:

- Do not use in poorly ventilated or confined spaces.
- Methylene chloride vapors are heavier than air and will collect in low areas.
- Keep container closed when not in use.
- Do not store in open, unlabeled or mislabeled containers.
- Liquid oxygen or other strong oxidants may form explosive mixtures with methylene chloride.
- This material or its vapors when in contact with flames, hot glowing surfaces or electric arcs can decompose to form hydrogen chloride gas and traces of phosgene.
- AVOID CONTAMINATION OF WATER SUPPLIES: Handling, storage, and use procedures must be carefully monitored to avoid spills or leaks. Any spill or leak has the potential to cause underground water contamination which may, if sufficiently severe, render a drinking water source unfit for human consumption. Contamination that does occur cannot be easily corrected.
- Caution should be taken not use in pressurized or totally enclosed system of light metal construction such as aluminum, magnesium, zinc or alloys thereof. Example, paint or adhesive spray system. (See form Sol 8208.21 attached.)

### Other Precautions:

- AVOID PROLONGED OR REPEATED BREATHING OF VAPORS. High vapor concentrations can cause dizziness, unconsciousness or death. Long-term overexposure may cause liver/kidney damage.
- USE ONLY WITH ADEQUATE VENTILATION. Ventilation must be sufficient to limit employee exposure to methylene chloride below OSHA permissible exposure limits (8-hour TWA - 500ppm; ceiling - 1,000ppm; maximum peak - 2,000ppm, 5 minutes in any 2 hours).
- AVOID CONTACT WITH EYES. Will cause irritation and pain.
- AVOID PROLONGED OR REPEATED CONTACT WITH SKIN. May cause irritation or dermatitis.
- DO NOT TAKE INTERNALLY. Swallowing may cause injury or death.

## References:

1. NIOSH Registry of Toxic Effects of Chemical Substances, 1978
2. Industrial Hygiene and Toxicology, Volume II, Second Edition, F.A. Patty, 1963
3. Dangerous Properties of Industrial Materials, Fifth Edition, N.I. Sax, 1979
4. Industrial Toxicology, Hamilton and Hardy, 1974
5. Toxicity and Metabolisms of Industrial Solvents, Browning, 1965
6. Toxicology, the Basic Science of Poisons, Casaretti and Doull, 1973
7. Federal Register, 45FR Hazardous Waste Management Systems Part III, Identification and Listing of Hazardous Wastes, Page 33084, May 19, 1980
8. EPA Science Advisory Board, Subcommittee on Airborne Carcinogens, September, 1980

**Comments:** As this solvent (methylene chloride) is used to clean and/or degrease a wide variety of metal and plastic parts, it should always be used in conjunction with properly designed and fully controlled solvent vapor degreasing equipment that is in compliance with the U.S. Environmental Protection Agency OAQPS Guidelines, "Control of Volatile Organic Emissions from Solvent Metal Cleaning", and/or all other applicable federal, state or local regulatory guidelines.

Methylene chloride is also used extensively in industry as a solvent, thinner, paint stripper, etc. It should always be used in conjunction with properly designed and fully controlled equipment that is in compliance with applicable federal, state and local regulatory guidelines.

# Material Safety Data Sheet

MSD 3208.22

DETREX CHEMICAL INDUSTRIES, INC.

P.O. BOX 501,

DETROIT, MICHIGAN 48232

Approved by U.S. Dept. of Labor as "Essentially similar" to Form OSHA-20



Date: August, 1982	Edition: First
Chemical Name and Synonyms: Perchloroethylene; tetrachloroethylene CAS No.: 127-18-4	Trade Name and Synonyms: DETREX PERK, Perchlor, Perchloroethylene
Chemical Family: Halogenated Hydrocarbons	Formula: $\text{CCl}_2=\text{CCl}_2$
DOT Shipping Name: Tetrachloroethylene	DOT Hazard Class: ORM-A-UN1897

## SECTION 1 • PHYSICAL DATA

Boiling Point @ 760 mm Hg: 250°F      121°C	Vapor Density (Air=1): 5.83	Specific Gravity ( $\text{H}_2\text{O}=1$ ): (20°/20°C) 1.6	pH of Solutions: 6.8 to 8.4
Freezing/Melting Point: -8.2°F      -22.3°C	Solubility (Weight % in Water): @25°C      0.015%	Bulk Density: 13.6 lbs./gal. @ 20°C	Volume % Volatile: Essentially 100
Vapor Pressure: @ 20°C = 14.2mmHg	Evaporation Rate (ethyl ether=1): 0.09	Heat of Solution: Not Applicable	Appearance and Odor: Clear, colorless liquid with ether-like odor.

## SECTION 2 • HAZARDOUS INGREDIENTS

	%	Hazard Data
Perchloroethylene (Stabilized)	100	See Sections 4 & 5

## SECTION 3 • FIRE AND EXPLOSION HAZARD DATA

Flash Point °F (Method Used) None	Flammable Limits in Air (% by Volume) None LEL:      UEL:	Extinguishing Media: For fires involving perchloroethylene, use water, dry chemical or carbon dioxide.
--------------------------------------	---	---

Special Fire Fighting Procedures: Fire fighters should wear pressure-demand self-contained breathing apparatus for possible exposure to hydrogen chloride and possible traces of phosgene.

Unusual Fire and Explosion Hazards: Perchloroethylene involved in fires can decompose to hydrogen chloride and possible traces of phosgene. See Detrex warning letter Form SoL 8208.21 attached.

## SECTION 4 • HEALTH HAZARD DATA

Permissible Exposure Limits (TLV): See Section 5

Toxicity Data Ref. (1)	Classification (Poison, Irritant, Etc.)
LC <sub>50</sub> Inhalation (rat) 4,000 ppm (4 hours)	Inhalation: Moderately Toxic
LD <sub>50</sub> Dermal	Skin/Eye: Liquid mildly irritating to skin; eye irritant
LD <sub>50</sub> Ingestion (rabbit) - 5,000 mg/kg	Ingestion: Slightly Toxic
Fish, LC <sub>50</sub> (Lethal Concentration) 96hr. TLM 100-10 ppm	Aquatic: Toxic

Human Exposure Information/Data: Unconfirmed data exists which indicate that perchloroethylene by ingestion may be more toxic to humans than indicated by the available data. Such unconfirmed data report poisonings at doses as low as 500 mg/kg.

**24-HOUR EMERGENCY ASSISTANCE: (313) 358-5800**

#### Section 4 (Cont'd)- Permissible Exposure Limits

Current OSHA permissible exposure limits (29CFR 1910.1000) are 100 ppm (8-hour TWA); 100-200 ppm periodic excursions are allowed providing 8-hour TWA is at or below 100 ppm; 200-300 ppm excursions allowed only for maximum of 5 minutes in any 3-hour period; 300 ppm maximum allowable concentration (must not be exceeded).

---

### **SECTION 5 - EFFECTS OF OVEREXPOSURE**

---

This section covers effects of overexposure for inhalation, eye/skin contact, ingestion and other types of overexposure information in the order of the most hazardous and the most likely route of overexposure.

---

Acute: Primarily a central nervous system depressant. Inhalation can cause irritation of the respiratory tract, dizziness, nausea, headache, loss of coordination and equilibrium, unconsciousness and if exposed to high concentrations in confined or poorly ventilated areas, even death.

Liquid splashed in the eye can result in discomfort, pain and irritation. Prolonged or repeated contact with liquid on the skin can cause irritation and dermatitis. The problem may be accentuated by liquid becoming trapped against the skin by contaminated clothing and shoes. Skin absorption can occur.

Chronic: Prolonged exposure above the OSHA permissible exposure limits may result in liver and kidney damage. Perchloroethylene has been extensively studied for cancer both in the U.S. and Europe by government, industry and academia. There is no documented evidence that perchloroethylene causes an increased cancer incidence in humans.

---

## EMERGENCY AND FIRST AID PROCEDURES:

---

**Inhalation:** Remove to fresh air. If not breathing, give artificial respiration, preferably mouth-to-mouth. If breathing is difficult, give oxygen. Call a physician.

**Eye or Skin Contact:** Flush eyes and skin with plenty of water (soap and water for skin) for at least 15 minutes, while removing contaminated clothing and shoes. If irritation occurs, consult a physician.

**Ingestion:** If conscious, drink a quart of water. DO NOT induce vomiting. Take immediately to a hospital or physician. If unconscious, or in convulsions, take immediately to a hospital or physician. DO NOT give anything by mouth to an unconscious person.

**Notes to Physician (Including Antidotes):** NEVER administer adrenalin following perchloroethylene overexposure. Increased sensitivity of the heart to adrenalin may be caused by over-exposure to perchloroethylene.

---

## SECTION 6 . REACTIVITY DATA

---

<b>Stability:</b> Stable	<b>Conditions to Avoid:</b> Avoid open flames, hot glowing surfaces or electric arc.
<b>Hazardous Polymerization:</b> Will not occur	<b>Conditions to Avoid:</b> None

**Incompatibility (Materials to Avoid):** Avoid contamination with caustic soda, caustic potash or oxidizing materials. Shock sensitive explosives may be formed. Also see Detrex warning letter Form SoL 8208.21 attached.

**Hazardous Decomposition Products:** Hydrogen chloride and possibly traces of phosgene.

---

## SECTION 7 . SPILL OR LEAK PROCEDURES (See Detrex Forms SoL 8208.14 and SoL 8208.15 attached)

---

**Steps to be Taken if Material is Spilled or Released:** Immediately evacuate the area and provide maximum ventilation. Unprotected personnel should move upwind of spill. Only personnel equipped with proper respiratory and skin/eye protection should be permitted in area. Dike area to contain spill. Take precautions as necessary to prevent contamination of ground and surface waters. Recover or absorb spilled material on sawdust or vermiculite and sweep into closed containers for disposal. After all visible traces have been removed, thoroughly wet vacuum the area. DO NOT flush to sewer. If area of spill is porous, remove as much contaminated earth and gravel, etc., as necessary and place in closed containers for disposal. (See Below)

---

### Waste Disposal Method:

Contaminated sawdust, vermiculite or porous surface must be disposed of in a permitted hazardous waste management facility. Recovered liquids may be reprocessed or incinerated or must be treated in a permitted hazardous waste management facility. Care must be taken when using or disposing of chemical materials and/or their containers to prevent environmental contamination. It is your duty to dispose of the chemical materials and/or their containers in accordance with the Clean Air Act, the Clean Water Act, the Resource Conservation and Recovery Act and all relevant state or local laws/regulations regarding disposal.

---



## SECTION 8 • SPECIAL PROTECTION INFORMATION

**Respiratory Protection:** For emergencies or working in confined areas, wear self-contained breathing apparatus or supplied air respiratory protection (use the "buddy system" and wear a safety harness with a lifeline). In other circumstances involving potential overexposures, use NIOSH/MSHA-approved organic vapor respirator. (Observe limitations directed by manufacturer.) Respiratory protection program must be in accordance with 29CFR 1910.134.

**Ventilation:** Mechanical (General) - Sufficient to maintain workplace concentration below applicable exposure limits.

**Eye Protection:** Splasher or goggles

**Gloves:** Polyethylene, neoprene or polyvinyl

**Decontamination Equipment:** Safety shower and eye-wash fountain in immediate area. Personnel protective clothing and use of equipment must be in accordance with 29CFR 1910.133 and 29CFR 1910.132.

## SECTION 9 • SPECIAL PRECAUTIONS

### Precautions to be Taken During Handling and Storing:

- Do not use in poorly ventilated or confined spaces.
- Perchloroethylene vapors are heavier than air and will collect in low areas.
- Keep container closed when not in use.
- Do not store in open, unlabeled or mislabeled containers.
- Liquid oxygen or other strong oxidants may form explosive mixtures with perchloroethylene.
- This material or its vapors when in contact with flames, hot glowing surfaces or electric arcs can decompose to form hydrogen chloride gas and traces of phosgene.
- AVOID CONTAMINATION OF WATER SUPPLIES: Handling, storage and use procedures must be carefully monitored to avoid spills or leaks. Any spill or leak has the potential to cause underground water contamination which may, if sufficiently severe, render a drinking water source unfit for human consumption. Contamination that does occur cannot be easily corrected.

### Other Precautions:

- AVOID PROLONGED OR REPEATED BREATHING OF VAPORS. High vapor concentrations can cause dizziness, unconsciousness or death. Long-term overexposure may cause liver/kidney injury.
- USE ONLY WITH ADEQUATE VENTILATION. Ventilation must be sufficient to limit employee exposure to perchloroethylene below OSHA permissible exposure limit (8-hour TWA - 100 ppm; ceiling 200 ppm; maximum peak 300 ppm, 5 minutes in any 3 hours). Observance of lower limits outlined in Section 4) is advisable.
- AVOID CONTACT WITH EYES. Will cause irritation and pain.
- AVOID PROLONGED OR REPEATED CONTACT WITH SKIN. May cause irritation or dermatitis.
- DO NOT TAKE INTERNALLY. Swallowing may cause injury or death.
- DO NOT EAT, DRINK OR SMOKE IN WORK AREAS.

### References:

1. OSHA Registry of Toxic Effects of Chemical Substances, 1978
2. Industrial Hygiene and Toxicology, Volume II, Second Edition, F.A. Patty, 1963
3. Hazardous Properties of Industrial Materials, Fifth Edition, N. I. Sax, 1979
4. Federal Register, 45FR Hazardous Waste Management Systems Part III, Identification and Listing of Hazardous Wastes, Page 33084, May 19, 1980
5. Science Advisory Board, Subcommittee on Airborne Carcinogens, September, 1980

**Comments:** As this solvent (perchloroethylene) is used to clean and/or degrease a wide variety of metal and plastic parts, it should always be used in conjunction with properly designed and fully controlled solvent vapor degreasing equipment that is in compliance with the U. S. Environmental Protection Agency, OAQPS Guidelines, "Control of Volatile Organic Emissions from Solvent Metal Cleaning", and/or any other applicable federal, state or local regulatory guidelines.

Perchloroethylene is also used extensively in the commercial drycleaning of clothes. It should always be used in conjunction with properly designed and fully controlled equipment that is in compliance with all applicable federal, state and local regulatory guidelines.

# DUPONT

## MATERIAL SAFETY DATA SHEET

### IDENTIFICATION

Name:  
Freon® TF Solvent  
Freon® PCA

Chemical Family:  
Halogenated Hydrocarbon

Synonyms:  
Trichlorotrifluoroethane  
R-113, FC-113

Formula:  
CCl3CFCF3

CAS Name:  
Ethane, 1,1,2-Trichloro-1,2,2-Trifluoro

CAS Registry No.  
76-13-1

Manufacturer/Distributor:  
E. I. du Pont de Nemours & Co. (Inc.)

Medical Emergency Phone:  
(800) 441-3637

Address:  
Freon® Products Division  
Wilmington, DE 19898

Transportation Emergency Phone:  
CHEMTREC (800) 424-9300

### PHYSICAL DATA

Boiling Point(°F):	117.6	Percent Volatile by Volume:	100%
Density:	1.57 g/cc @/77°F	Vapor Pressure:	334mm Hg @/77°F
Vapor Density (Air = 1):	6.5	Solubility in H <sub>2</sub> O:	0.02% by wt. @ 77°F
pH Information:	Neutral	Evaporation Rate (CCl <sub>4</sub> = 1):	0.1
Form:	Liquid	Appearance:	Clear
Color:	Colorless	Odor:	Slight Ethereal Odor

### HAZARDOUS COMPONENTS

Material(s): Trichlorotrifluoroethane	Approximate % : 100
--	------------------------

### HAZARDOUS REACTIVITY

Stability:  
Material is stable. However, avoid open flames and high temperatures.

This Material Safety Data Sheet contains only the specific data as described.  
It is not intended to be used in conjunction with any other material or safety data.

Incompatibility:  
Alkali or alkaline earth metals - powdered Al, Zn, Be, etc.

Decomposition:  
This compound can be decomposed by high temperatures (open flames, glowing metal surfaces, etc.) forming hydrochloric and hydrofluoric acids - possible carbonyl halides.

Polymerization:  
Will not occur

#### FIRE AND EXPLOSION DATA

Flash Point:  
None

Method:  
TOC

Autoignition Temperature:  
Not Determined

Flammable Limits in Air, % by Vol.  
Lower: Nonflammable  
Upper: Nonflammable

Autodecomposition Temperature:  
Not Determined

Fire and Explosion:  
Drums may rupture under fire conditions. Decomposition may occur.

Extinguishing Media:  
Nonflammable

Special Fire Fighting Instructions:  
Self-contained breathing apparatus (SCRA) may be required if drums rupture and contents are spilled under fire conditions.

#### HEALTH HAZARD INFORMATION

##### Principal Health Hazards:

Inhalation: Vapor is heavier than air and can cause suffocation by reducing oxygen available for breathing. Breathing high concentrations of vapor may cause light-headedness, giddiness, shortness of breath, and may lead to narcosis, cardiac irregularities, unconsciousness or death. LC 50 Rats 52,000 ppm/4 hrs.

Note: In screening studies with experimental animals, exposure at approximately 5000 ppm (v/v) and above, followed by a large intravenous epinephrine challenge, has induced serious cardiac irregularities.

Skin: Not a corrosive or irritant after single contact; however, repeated liquid contact can cause defatting of the skin resulting in irritation. This material is poorly absorbed through the skin (Rabbit ALD >11,000 mg/kg).

Eye: Liquid contact can cause discomfort, usually no extended effect.

Oral: Although oral toxicity is low [LD 50 Rat 43000 mg/kg], ingestion of FC-113 is to be avoided.

Exposure Limits:

PEL (OSHA) 1,000 ppm

TLV® TWA (ACGIH) 1,000 ppm

Safety Precautions:

Avoid breathing vapors and prolonged skin exposure. Use only in well ventilated area.

First Aid:

Inhalation: Remove to fresh air, call a physician. If not breathing, give artificial respiration, preferably mouth-to-mouth. If breathing is difficult, give oxygen. Do not give epinephrine or similar drugs.

Note to Physician: Because of a possible increased risk of eliciting cardiac dysrhythmias, catecholamine drugs, such as epinephrine, should be considered only as a last resort in life threatening emergencies.

Eye: In case of contact, immediately flush eyes with plenty of water for at least 15 minutes. Call a physician.

Skin: Flush with water. Get medical attention if irritation is present.

Oral: No specific intervention is indicated as the compound is not likely to be hazardous by ingestion. However, consult a physician if necessary. Do not induce vomiting as the hazard of aspirating the material into the lungs is a greater hazard than allowing it to progress through the intestinal tract.

Medical Conditions Possibly Aggravated by Exposure:

Cardiovascular Disease: See Principal Hazards: Inhalation Section.

Other Health Hazards:

Freon® 113 is not listed as a carcinogen by IARC, NTP or OSHA. Based on animal studies and human experiences this fluorocarbon poses no hazard to man relative to systemic toxicity, carcinogenicity, mutagenicity, or teratogenicity when occupational exposures are below its TLV®.

PROTECTION INFORMATION

Generally Applicable Control Measures:

Normal ventilation for standard manufacturing procedures is generally adequate. Local exhaust should be used when large amounts are released. Mechanical ventilation should be used in low places.

Personal Protective Equipment:

Butyl gloves should be used to avoid prolonged or repeated exposure. Chemical splash goggles should be available for use as needed to prevent eye contact. Under normal manufacturing conditions no respiratory protection is required when using this product. Self-contained breathing apparatus (SCBA) is required if a large spill occurs.

DISPOSAL INFORMATION

Spill, Leak or Release:

Ventilate area. Do not flush into sewers. Dike spill. Collect on absorbent material and transfer to steel drums for recovery or disposal. Comply with federal, state and local regulations on reporting releases.

Waste Disposal: Comply with federal, state and local regulations. Remove to a permitted waste disposal facility. EPA Hazardous Waste Nos. F001 and F002 may apply to waste materials.

SHIPPING INFORMATION

Domestic - Other Than Air (DOT)

Proper Shipping Name

Not Regulated

International Water or Air (IMO/ICAO)

Proper Shipping Name

Not Regulated

Other Information

Shipping Containers

Drums, tank trucks, tank cars

Storage Conditions

Clean, dry area. Do not heat

above 125°F.

Date Revised: 10/85

Person responsible: T. D. Armstrong, C&P Dept., Freon® Products Lab,  
Chestnut Run, Bldg. 711, Wilmington, DE 19898  
(302) 999-3847 or (302) 999-4338.

E-77806-1

F2.4



ATTACHMENT  
C-2

ATTACHMENT C-2

SOLVENT CONTENT AND  
COMPOSITE SAMPLING PROCEDURES

Date: 11/08/88  
Revision: 88-0  
Attachment: C-2

Determination of Solvent Content Using Specific Gravity Method

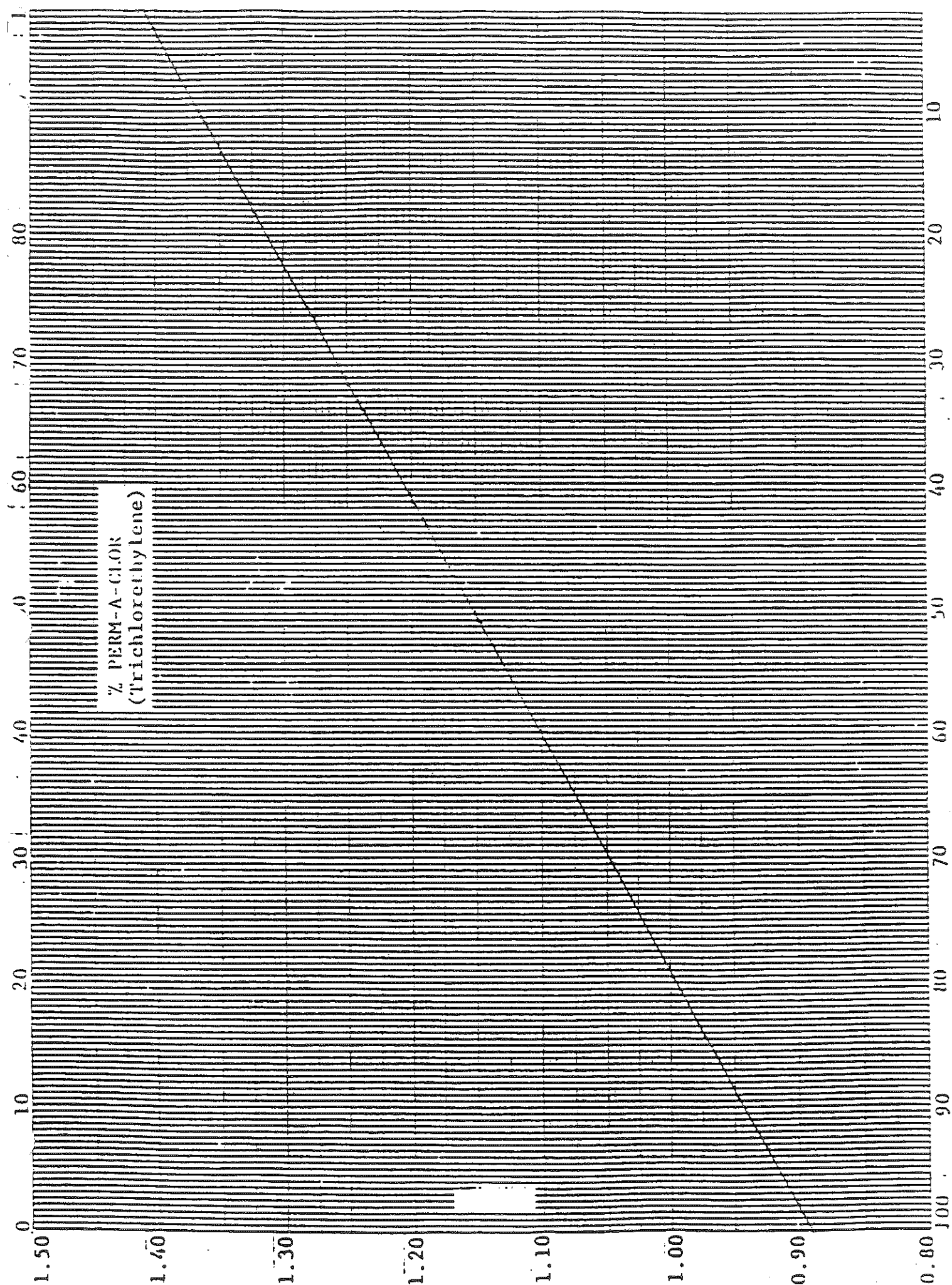
Procedure

Collect sample using the Glass Thief or Alternate Device

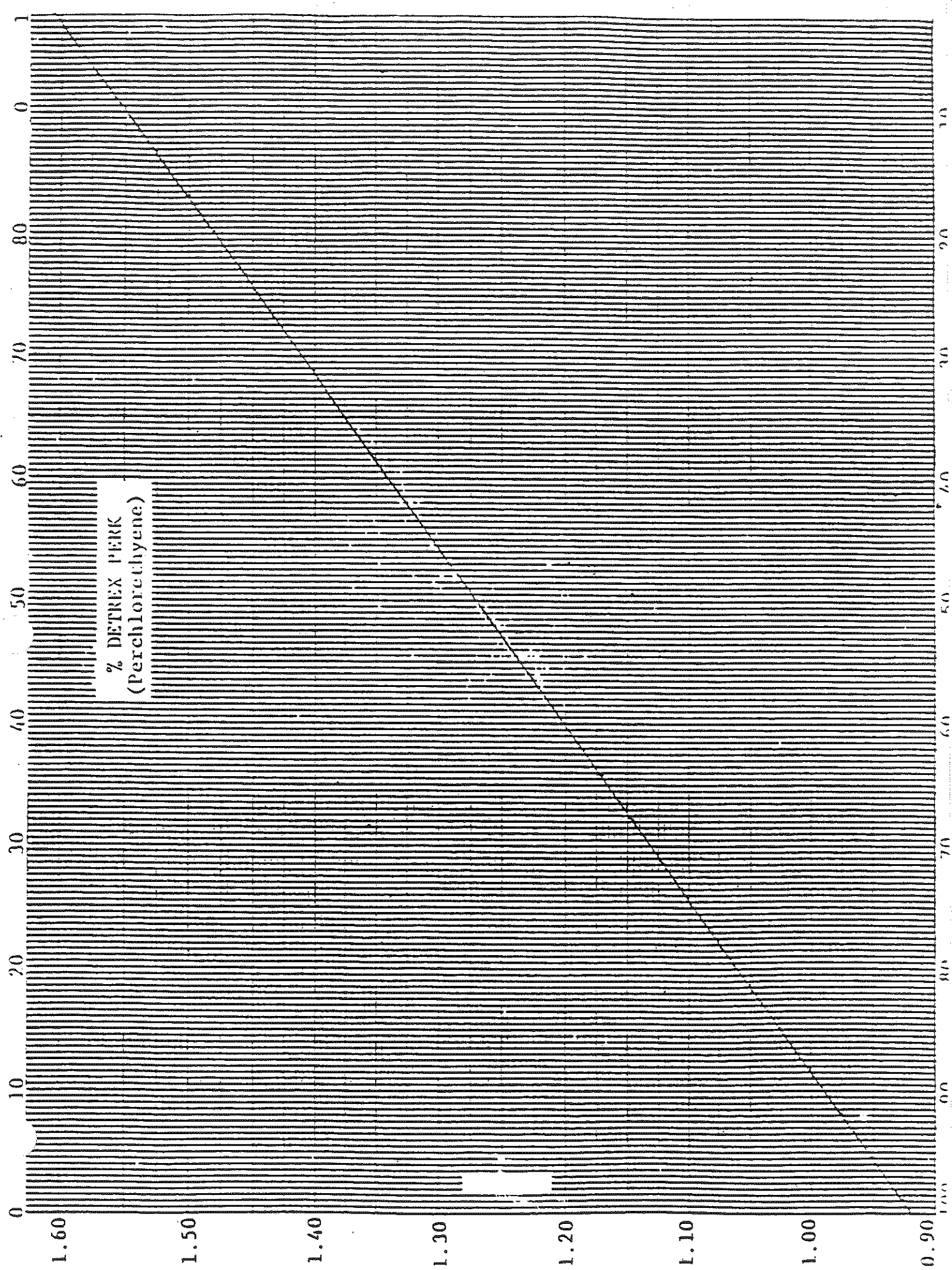
1. Transfer sample to a container of sufficient size to allow for mixing.
2. Shake container for at least 30 seconds.
3. Place the thermometer and a hydrometer in the hydrometer jar.
4. Fill the hydrometer jar to within one inch of the top with the mixture to be tested.
5. If the hydrometer reads off-scale, replace it with a higher or lower range hydrometer as required.
6. Read the hydrometer to the nearest 0.10 SpG Unit.
7. Using the attached Solvent-oil Mixture vs. SPECIFIC Gravity Chart, determine the weight per cent oil.
8. The solvent content is calculated as follows:

WEIGHT PER CENT SOLVENT = 100% - WEIGHT PER CENT OIL





PERCENTAGE PERCHLOROETHYLENE



% DETREX PERK  
(Perchloroethylene)

1.50  
1.40  
1.30  
.20  
.10  
.00  
.90  
.80

% PERM-ETHANE ( 1,1,1 Trichlorethane )

0 10 20 30 40 50 60 70 80 90

% PERM-ETHANE  
(1,1,1 Trichlorethane)  
OF METHYLENE CHLORIDE

1.00  
0.90  
0.80  
0.70  
0.60  
0.50  
0.40  
0.30  
0.20  
0.10  
0.00

Date: 11/08/88

Revision: 88-0

Attachment: C-2

Composite Sample Collection  
Procedure

- 1) Obtain a sample from each drum in a lot (15 drums maximum) of a particular solvent waste (i.e. TCE waste) using a glass thief or alternate device. Place each sample into a graduated cylinder, flask or beaker.
- 2) Thoroughly mix the composite sample.
- 3) Draw from the composite one 4 ounce (fl.) sample and label accordingly.
- 4) Send the sample to the Detrex laboratory in either Detroit, Michigan or Ashtabula, Ohio.
- 5) Use a portion of the remaining composite to determine solvent content by the Specific Gravity Method.



Date: 11/08/88  
Revision: 88-0  
Page: D-1

## SECTION D

### PROCESS INFORMATION

Date: 11/08/88  
Revision: 88-0  
Page: D-1

## SECTION D

### PROCESS INFORMATION

TABLE OF CONTENTS

Page

SECTION D  
PROCESS INFORMATION

D-1	CONTAINERS [40 CFR §270.15]	D-5
D-1a(1)	Description of Containers [40 CFR §264.171 and .172]	D-5
D-1a(2)	Container Management Practice [40 CFR §264.173]	D-6
D-1a(3)	Secondary Containment System Design and Operation [40 CFR §270.15(a), (b), §264.175(a)]	D-7
D-1a(3)(a)	Requirement for the Base Cor. Liner to Contain Liquids [40 CFR §270.15(a)(1), §264.175(b)(1)]	D-7
D-1a(3)(b)	Containment System Drainage [40 CFR §270.15(a)(2), §264.175(b)(2)]	D-8
D-1a(3)(c)	Containment System Capacity [40 CFR §270.15(a)(3), §264.175(b)(3)]	D-8
D-1a(3)(d)	Control of Run-On [40 CFR §270.15(a)(4), §264.175(b)(4)]	D-9
D-1a(4)	Removal of Liquids from Containment System [40 CFR §270.15(a)(5), §264.175(b)(5)]	D-9
D-2	TANKS [40 CFR §270.16]	D-10
D-3	WASTE PILES [40 CFR §270.18]	D-10
D-4	SURFACE IMPOUNDMENTS [40 CFR §270.17]	D-10
D-5	INCINERATORS [40 CFR §270.19]	D-10
D-6	LANDFILLS [40 CFR §270.21]	D-10
D-7	LAND TREATMENT [40 CFR §270.20]	D-10



Date: 06/19/89

Revision: 89-1

Page: D-3

LIST OF ATTACHMENTS

ATTACHMENT D-1 FACILITY PLAN, CONTAINER STORAGE AND  
SECONDARY CONTAINMENT DETAILS,  
LOADING/UNLOADING RAMP DETAILS

ATTACHMENT D-2 HAZARDOUS WASTE DRUM LABEL

ATTACHMENT D-3 SECONDARY CONTAINMENT VOLUME

Date: 11/08/88  
Revision: 88-0  
Page: D-4

## SECTION D

### PROCESS INFORMATION

This section provides specific process information for the hazardous waste container storage area at the Gold Shield Solvents facility in Grand Rapids, Michigan. The details are provided pursuant to Michigan Act 64 Rule 299.9504(1)(g), (2), and (3) which incorporates by reference 40 CFR §270.15 and 16. The applicable section(s) of the federal regulations (40 CFR) is referenced where applicable.

A hazardous waste container storage area is used to store wastes prior to transport off site. The entire operation is located within a single enclosed building.

Hazardous wastes are received at the Gold Shield Solvents facility in 55-gallon drums. Upon receipt all drums are transferred to an appropriate area in the hazardous waste container storage area.

A facility plan is presented in Attachment D-1. This figure locates the hazardous waste container storage area within the Gold Shield Solvents building.

D-1 CONTAINERS [40 CFR §270.15]

Hazardous wastes that are received at the Detrex solvent recovery facility in 55-gallon drums are placed in a container storage area prior to transport off site. Each drum is labeled (see sample label in Attachment D-2) according to its contents and manifest information. The location of the container storage area is shown in Attachment D-1.

Additional container storage areas are present in the facility, however, virgin solvent products and empty drums are stored in these areas. Product drum labels are completely different to distinguish between product and waste drums.

D-1a(1) Description of Containers  
[40 CFR §264.171 and .172]

Virgin solvent is sold by Detrex Gold Shield Solvents to customers in new 55-gallon drums meeting the requirements of the U.S. Department of Transport Specification No. 17E (DOT 17E). When the solvent is returned to Detrex in waste form, it is usually returned in the original drum in which the virgin material was shipped. In any case, the waste must be returned in a drum which meets the following requirements:

1. Not have any leaks;
2. Not have excessive corrosion or rust build up which could, upon handling, become a leak;
3. Not be excessively dented such that the usable drum volume is less than 55-gallons;
4. Be properly sealed with suitable bung; and
5. Be properly labeled, manifested and accompanied with proper notification, if necessary.

Since Detrex Gold Shield Solvents delivers virgin solvents to customers in its own trucks, it is common practice to pick up the waste material at the same time. Gold Shield Solvents truck drivers are able to check each drum to see that the criteria outlined above are met. Drums not meeting this criteria are not accepted.

If waste drums are received at the Gold Shield Solvents facility by other than Detrex's truck, the drums are inspected upon arrival, to ensure their conformance with the above listed requirements.

All of the halogenated solvent wastes stored at the Gold Shield Solvents facility are compatible with the steel drum material. While stored at the Detrex facility, all hazardous waste containers are properly labeled.

D-1a(2) Container Management Practice  
[40 CFR §264.173]

All drums must meet the requirements specified previously in Section D-1a(1). The drums remain tightly sealed during storage in the container storage area and are opened only when the waste material is to be tested.

The drums are stored in the vertical position. The drums are situated in rows with adequate aisle space to allow for inspection (see Attachment D-1). If necessary, drums are stacked up to two layers high. The maximum hazardous waste inventory at the facility is 398 drums (21,900 gallons).

Drums are transferred within the building by a forklift with a drum handling attachment. Hand drum trucks may also be used to transport drums short distances.

There are no ignitable, reactive or incompatible hazardous wastes handled at this facility.

The following procedures are followed whenever Detrex is receiving and/or hauling hazardous wastes:

- 1) Gold Shield Solvents transports only properly manifested and labeled shipments of hazardous waste that meet the container requirements outlined in Section D-1a(1).
- 2) Only halogenated solvents are accepted;
- 3) The manifest is signed and dated. One copy of the signed manifest is given immediately to the transporter, if other than Detrex, one copy is returned to the waste generator within 30 days, one copy is retained at the facility for a period of at least three years; and one copy is returned to the MDNR Director or his or her designee within a period of 10 days after the end of the month in which the waste was received;
- 4) Shipments are recorded in the Customer Hazardous Waste Shipment Ledger upon receipt at the Gold Shield Solvents facility;

- 5) A sample is taken from each drum, per the waste analysis plan in Section C, for analysis; and
- 6) Drums are stored in the properly designated, secured area. After analysis and the data available, the waste material is shipped out for reclamation (recovery) to an off-site Detrex facility or to an off-site permitted treatment/disposal facility, as appropriate.

Careful records are kept of all incoming hazardous wastes in accordance with Rule 299.9609 and biennial reporting is completed in accordance with Rule 299.9610.

D-1a(3) Secondary Containment System Design and Operation  
[40 CFR §270.15(a),(b), §264.175(a)]

D-1a(3)(a) Requirement for the Base or Liner to Contain Liquids  
[40 CFR §270.15(a)(1), §264.175(b)(1)]

All drummed hazardous wastes are placed in the designated hazardous waste container storage area after being received on site. The container storage area is located within a single enclosed building.

The base of the container storage area is constructed of hardwood overlain with steel plating. The base is permeable, allowing spilled or leaked material, if any, to penetrate it easily. Secondary containment is, however, provided by a basement directly underlying the container storage area.

Design or as-built construction drawings are not available for the building. As such, engineering plans of the container storage area/secondary containment area are not available. In lieu of such plans, drawings detailing existing conditions of the container storage area/secondary containment area and the loading/unloading area have been prepared and are also provided in Attachment D-1. Engineering certification of the drawings presented is also provided in Attachment D-1.

The basement floor slab is constructed of poured concrete and the walls are constructed of either poured concrete or concrete blocks. The base of an old elevator shaft acts as a collection sump for the basement.

There are no floor drains or other such openings in the secondary containment area. The basement underlying other portions of the facility is separated by means of a 4-inch high ramp.

An engineering certification of the secondary containment area, pursuant to R299.9508(l)(d), is not provided at this time. In lieu of the certification, the following program will be implemented by Detrex and completed by April 30, 1990 subsequent to which certification will be provided to the MDNR.

All existing expansion joints and any cracks will be cleaned out, saw cut if necessary to provide a clean opening. Subsequently, all expansion joints and any cracks will be filled with a compatible chemically resistant flexjoint sealant. The peripheral walls will also be sealed with the selected seal and to a height of 1 foot above the concrete slab. The selected sealant will be installed in accordance with the manufacturer's specifications. The concrete slab and peripheral walls, with sealed joints, will serve as a sufficiently impervious containment structure.

D-1a(3)(b) Containment System Drainage  
[40 CFR §270.15(a)(2), §264.175(b)(2)]

The containers within the container storage area are provided with adequate aisle space and are elevated above the secondary containment area to allow for routine inspection. If an inspection of the container storage area or secondary containment area discovers the presence of spilled or leaked material, clean-up will be conducted. If necessary, the forklift can be used to move drums in order to complete the necessary clean-up.

D-1a(3)(c) Containment System Capacity  
[40 CFR §270.15(a)(3), §264.175(b)(3)]

The total capacity of the secondary containment system at the Gold Shield Solvents facility is approximately 9,750 gallons (see Attachment D-3). The maximum volume of drummed hazardous waste stored at the facility is 21,900 gallons.

Pursuant to the regulations, the containment system must have sufficient capacity to contain ten percent (10%) of the volume of containers. Thus, more than adequate containment is provided by the secondary containment system for the container storage area.

D-1a(3)(d) Control of Run-On  
[40 CFR §270.15(a)(4), §264.175(b)(4)]

Run-on into the containment system is eliminated by the building structure. All precipitation is controlled outside of the facility and drainage is promoted away from the building with the exception of the loading/unloading ramp. Precipitation collected in the ramp drains to a sump that discharges to the storm sewer. The cover to the sump has recently been fitted with a gasket bolted down and coated with an epoxy sealant. Therefore, the release of spilled material, if any, will be contained in the loading/unloading area ramp.

In order to minimize flow into the ramp area, Detrex Corporation recently constructed an interceptor trench across the entire width of the interceptor trench is constructed of concrete with an overlying steel grate. The trench is located approximately 12 feet inside the overhead door to the loading/unloading ramp. The ramp is approximately 20 feet long, 11 inches wide and 8 inches deep with a total capacity of approximately 92 gallons. The trench is connected to the sump via a 4-inch diameter PVC pipe. The location and details of the trench are presented in Attachment D-1.

Since the facility is an existing facility, Detrex Corporation requests an exemption from Rules 299.9604(1)(a) and (b) pursuant to Rule 299.9604(2).

D-1a(4) Removal of Liquids from Containment System  
[40 CFR §270.15(a)(5), §264.175(b)(5)]

Routine inspections for the presence of spilled or leaked materials within the secondary containment system are conducted. The inspection items and schedule are presented in Section F of this operating license application. As required, accumulated liquids, if any, are collected from the secondary containment system with pumps and/or absorbent material. The collected material is drummed and stored in the hazardous waste container storage area prior to transfer to an off-site Detrex reclaiming (reading) facility or to an off-site permitted treatment/disposal facility.

**D-2 TANKS [40 CFR §270.16]**

Detrex Corporation does not and has never had a hazardous waste storage tank at the Gold Shield Solvents facility in Grand Rapids, Michigan; hence, an operating license for a storage tank is not requested.

**D-3 WASTE PILES [40 CFR §270.18]**

Detrex Corporation does not and has never had a waste pile at the Gold Solvents facility in Grand Rapids, Michigan; hence, an operating license for waste piles is not requested.

**D-4 SURFACE IMPOUNDMENTS [40 CFR §270.17]**

Detrex Corporation does not have and has never had surface impoundment at the Gold Shield Solvents facility in Grand Rapids, Michigan; hence, a permit/operating license for a surface impoundment is not requested.

**D-5 INCINERATORS [40 CFR §270.19]**

Detrex Corporation does not and has never had a hazardous waste incinerator at the Gold Solvents facility in Grand Rapids, Michigan; hence, a permit/operating license for an incinerator is not requested.

**D-6 LANDFILLS [40 CFR §270.21]**

Detrex Chemical Industries does not and has never had a hazardous waste landfill at the Gold Solvents facility in Grand Rapids, Michigan; hence, a permit/operating license for a landfill is not requested.

**D-7 LAND TREATMENT [40 CFR §270.20]**

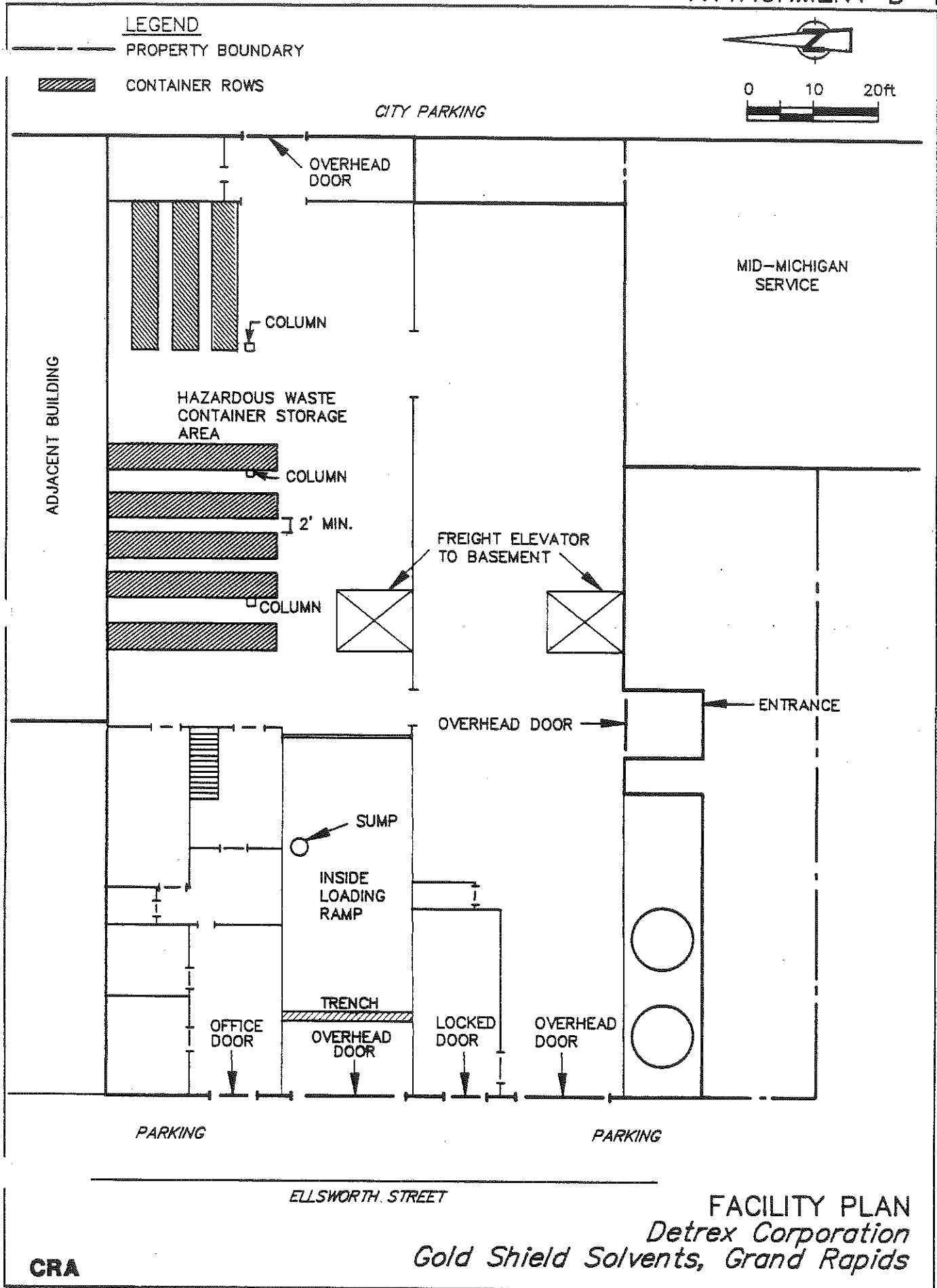
Detrex Chemical Industries does not and has never had a hazardous waste land treatment system at the Gold Solvents facility in Grand Rapids, Michigan; hence, a permit/operating license for a land treatment system is not requested.

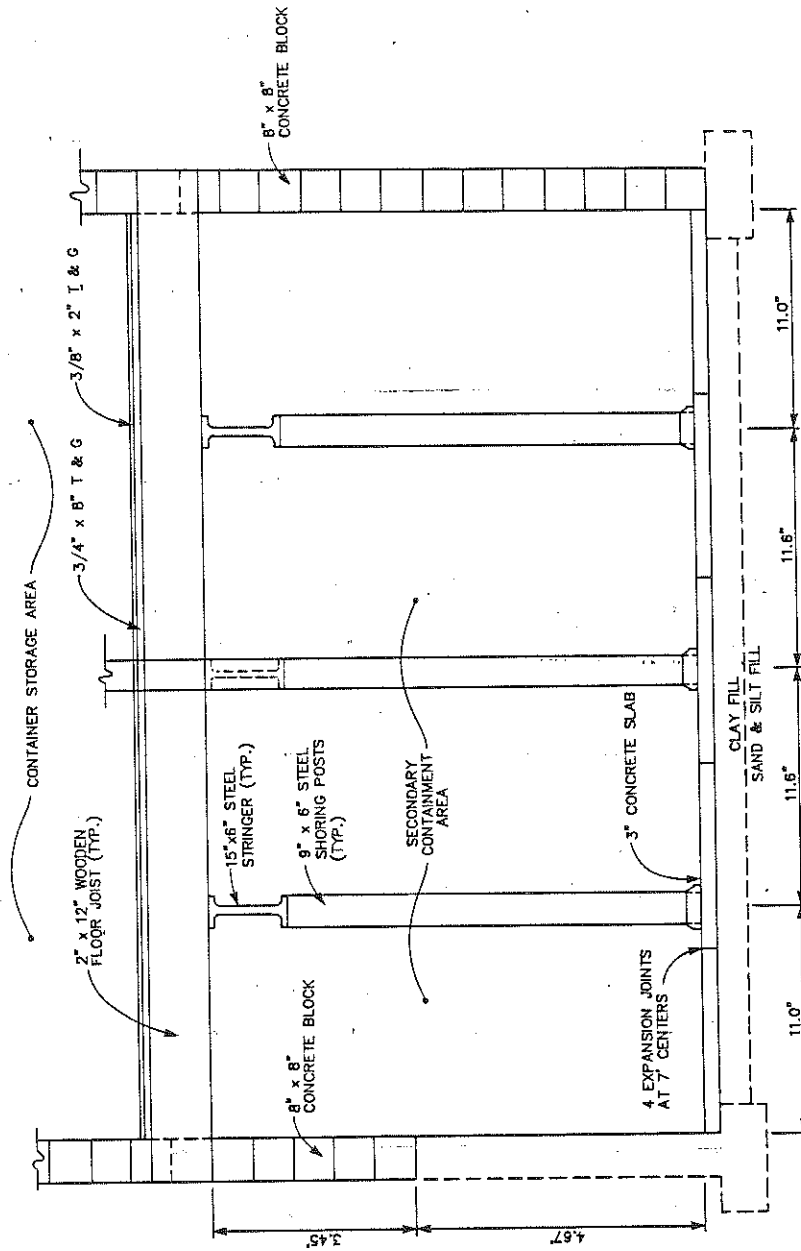




ATTACHMENT D-1

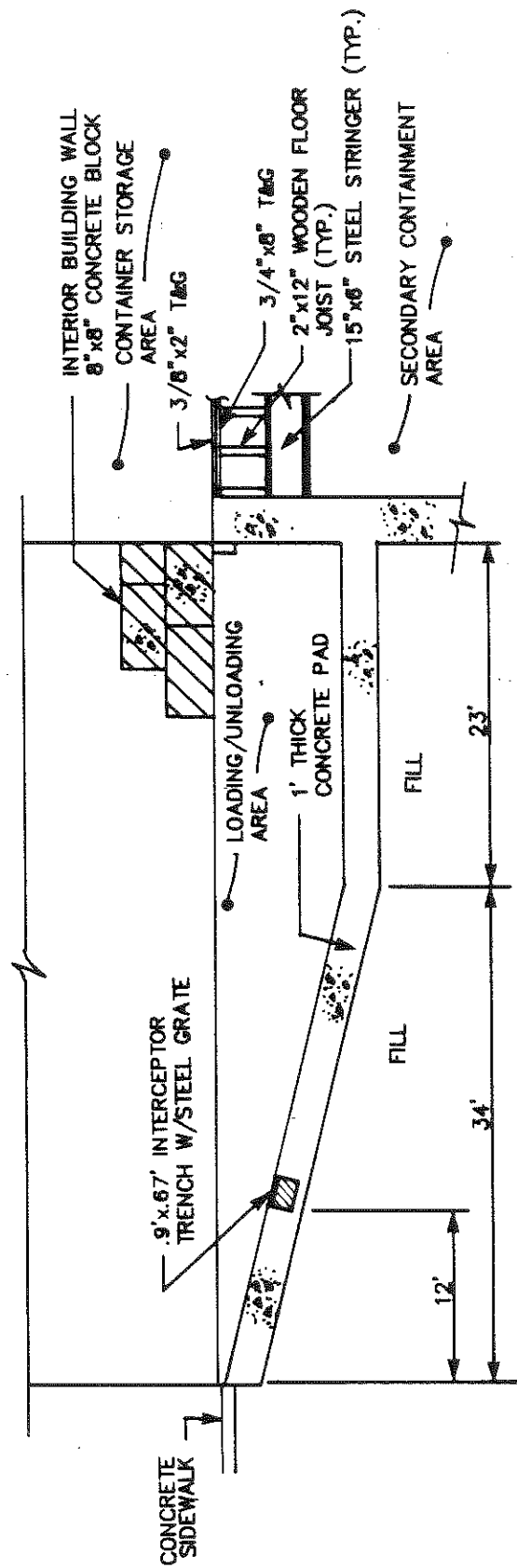
FACILITY PLAN





N.T.S.

TYPICAL CROSS-SECTION  
EXISTING DETAILS  
CONTAINER STORAGE AREA/SECONDARY CONTAINMENT AREA  
Detrex Corporation  
Gold Shield Solvents, Grand Rapids



TYPICAL CROSS-SECTION  
EXISTING DETAILS  
LOADING/UNLOADING AREA  
*Detrex Corporation*  
*Gold Shield Solvents, Grand Rapids*

Date: 06/19/89  
Revision: 89-1  
Attachment: D-1d

I certify that I have reviewed the following drawings and that in conjunction with each other they represent the existing conditions of the container storage area/secondary containment area and the loading/unloading area at Detrex Corporation's Grand Rapids facility (MID 020906764):

- 1) Attachment D-1(b) - Secondary Containment Area Cross-Section; and
- 2) Attachment D-1(c) - Loading/Unloading Area Cross-Section.

Signature	<u>Issa H. Shamiyeh</u>
Name	<u>Issa H. Shamiyeh</u>
Title	<u>Risk Management Director</u>
Date	<u>June 16, 1989</u>

Issa H. Shamiyeh

ATTACHMENT  
D-2

ATTACHMENT D-2

HAZARDOUS WASTE

DRUM LABEL



YELLOW BACKGROUND AND BORDER

<b>HAZARDOUS WASTE</b>	
<b>FEDERAL LAW PROHIBITS IMPROPER DISPOSAL</b>	
IF FOUND, CONTACT THE NEAREST POLICE OR PUBLIC SAFETY AUTHORITY, OR THE U.S. ENVIRONMENTAL PROTECTION AGENCY.	
ACCUMULATION START DATE _____	E.P.A. WASTE NO. _____
D.O.T. PROPER SHIPPING NAME _____	U.N. OR N.A. NO. _____
GENERATOR NAME _____	
ADDRESS _____	
CITY _____	STATE _____
E.P.A. I.D. NO. _____	MANIFEST DOCUMENT NO. _____
<b>HAZARDOUS WASTE HANDLE WITH CARE</b>	

29-HML (Rev. 3/87)


 Produced by: J.J. KELLER & ASSOCIATES, INC.  
 Kenosha, Wisconsin 53150 • (414) 722-2848

RED LETTERING

BALANCE OF LETTERING IS BLACK

HAZARDOUS WASTE DRUM LABEL

*Detrex Corporation**Gold Shield Solvents, Grand Rapids***CRA**

ATTACHMENT  
D-3

ATTACHMENT D-3

SECONDARY CONTAINMENT SYSTEM CAPACITY

ATTACHMENT D-3

Secondary Containment System Capacity

$$\begin{aligned}\text{Secondary Containment Area} &= 45 \text{ ft} \times 80 \text{ ft} \\ &= 3600 \text{ ft}^2\end{aligned}$$

$$\text{Secondary Containment Height} = 1/3 \text{ ft}$$

$$\begin{aligned}\text{Sump Area} &= 6 \frac{1}{4} \text{ ft} \times 8 \text{ ft} \\ &= 50 \text{ ft}^2\end{aligned}$$

$$\text{Sump Height} = 2 \text{ ft}$$

$$\begin{aligned}\text{Total Secondary Containment Volume} &= (1/3) (3600) + (2) (50) \\ &= 1300 \text{ ft}^3 \\ &= 9750 \text{ gallons}\end{aligned}$$

$$\text{TOTAL SECONDARY CONTAINMENT CAPACITY} = \underline{9750 \text{ gallons}}$$



Date: 06/19/89  
Revision: 89-1  
Page: E-1

## SECTION E

### ENVIRONMENTAL MONITORING

## TABLE OF CONTENTS

	<u>Page</u>
E-1 HYDROGEOLOGIC REPORT [Rule 299.9506].....	E-6
E-1a INTERIM STATUS PERIOD GROUNDWATER MONITORING [Rule 299.9506(1)(a)] .....	E-6
E-1b IDENTIFICATION OF UPPERMOST AQUIFER [Rule 299.9506(1)(b)] .....	E-6
E-1c IDENTIFICATION OF AQUIFERS UTILIZED [Rule 299.9506(1)(c) and (f)].....	E-7
E-1d OTHER AQUIFERS [Rule 299.9506(d)] .....	E-7
E-1e TOPOGRAPHIC MAP REQUIREMENTS [Rule 299.9506(1)(e)] .....	E-10
E-1f CONTAMINANT PLUME DESCRIPTION [Rule 299.9506(g)].....	E-10
 E-2 GROUNDWATER MONITORING PROGRAM [Rule 299.9611(2)(a), 299.9612] .....	 E-11
E-2a GENERAL GROUNDWATER MONITORING REQUIREMENTS [40 CFR § 270.14(c)5, § 264.97].....	E-11
E-2a(1) DESCRIPTION OF WELLS [40 CFR § 264.97(a)].....	E-11
E-2a(2) MONITORING WELL DESIGN [40 CFR § 264.97(c)] .....	E-11
E-2a(3) SAMPLING AND ANALYSIS PROCEDURES [40 CFR § 264.97(d), (e) and (f)] .....	E-12
E-2a(4) PROCEDURES FOR ESTABLISHING BACKGROUND GROUNDWATER QUALITY 40 CFR§264.97(g)] .....	E-12
E-2a(5) PROPOSED POINT OF COMPLIANCE [40 CFR § 264.95(c)].....	E-13
E-2b DETECTION MONITORING PROGRAM [40 CFR § 264.98].....	E-13
E-2b(1) MONITORING PARAMETERS [40 CFR § 264.98(a)].....	E-14
E-2b(2) DETECTABILITY [40 CFR § 264.98(a)(3)] .....	E-14
E-2b(3) BACKGROUND CONCENTRATIONS AND COEFFICIENTS OF VARIANCE [40 CFR § 264.98(a)(4)] .....	E-14
E-2b(4) DETECTION GROUNDWATER MONITORING SYSTEM [40 CFR § 264.98(b)].....	E-14
E-2b(5) SAMPLING, ANALYSIS AND STATISTICAL COMPARISON PROCEDURES [40 CFR § 264.98(c), (d), (e), (f)] .....	E-15
E-2b(5)(i) SAMPLE COLLECTION.....	E-15
E-2b(5)(ii) SAMPLE PRESERVATION AND SHIPMENT .....	E-15
E-2b(5)(iii) ANALYTICAL PROCEDURES.....	E-15
E-2b(5)(iv) CHAIN-OF-CUSTODY.....	E-15

Date: 06/19/89  
Revision: 89-1  
Page: E-3

TABLE OF CONTENTS

	<u>Page</u>
E-2b(5)(v) ADDITIONAL REQUIREMENTS FOR COMPLIANCE POINT MONITORING.....	E-16
E-2b(5)(vi) ANNUAL DETERMINATION.....	E-16
E-2b(5)(vii) STATISTICAL DETERMINATION COMPARISON PROCEDURE.....	E-17
E-3 ANNUAL SOIL MONITORING PROGRAM WAIVER.....	E-18
E-4 AIR MONITORING .....	E-19



Date: 06/19/89  
Revision: 89-1  
Page: E-4

LIST OF TABLES

		Following <u>Page</u>
TABLE E-1	SOURCE OF MAJOR COMMUNITY WATER SUPPLIES IN KENT COUNTY	E-7
TABLE E-2	HYDRAULIC CHARACTERISTICS OF WATER WELLS IN KENT COUNTY	E-7
TABLE E-3	WATER QUALITY SUMMARY OF COMMUNITY WATER SYSTEMS DEVELOPED IN THE GLACIAL DRIFT AQUIFER IN KENT COUNTY	E-7
TABLE E-4	WATER QUALITY SUMMARY OF COMMUNITY WATER SYSTEMS DEVELOPED IN BEDROCK FORMATIONS IN KENT COUNTY	E-8
TABLE E-5	TOPOGRAPHIC MAP REQUIREMENTS	E-10

LIST OF ATTACHMENTS

ATTACHMENT E-1	HYDROGEOLOGIC REPORT
ATTACHMENT E-2	PROPOSED MONITORING WELL LOCATIONS
ATTACHMENT E-3	TYPICAL MONITORING WELL DETAIL
ATTACHMENT E-4	SAMPLING AND ANALYSIS PROCEDURES
ATTACHMENT E-5	STATISTICAL TESTING PROCEDURE

Date: 06/19/89  
Revision: 89-1  
Page: E-5

## SECTION E

### ENVIRONMENTAL MONITORING

This section of the operation license application provides a hydrogeologic report pertaining to the Detrex Corporation Gold Shield Solvents facility in Grand Rapids, Michigan as required by Michigan Act 64 Rule 299.9506(1) and (2). This section also provides a groundwater monitoring program pursuant to Rule 299.9611(2)(a).

E-1 HYDROGEOLOGIC REPORT [Rule 299.9506]

A hydrogeologic investigation was conducted at the Detrex Corporation Gold Shield Solvents facility in Grand Rapids, Michigan. An engineering report which details the field activities of the investigation and summarizes all the data collected is presented in Attachment E-1. In addition to the engineering report presented in Attachment E-1, the following information is presented to satisfy the requirements of Rule 299.9506(1).

E-1a INTERIM STATUS PERIOD GROUNDWATER MONITORING  
[Rule 299.9506(1)(a)]

No interim status groundwater monitoring was required for the hazardous waste container storage area.

E-1b IDENTIFICATION OF UPPERMOST AQUIFER  
[Rule 299.9506(1)(b)]

Two aquifers were encountered at the site during the hydrogeologic investigation. They consist of a shallow system located within alluvial sand and gravel at a depth of approximately 20 to 25 feet below ground surface and a deeper bedrock system. The two aquifers are separated by a lower till unit which is non-water bearing. The lower till unit was determined to have a hydraulic conductivity less than  $2 \times 10^{-8}$  cm/sec. The lower till unit is considered a confining layer and as such the two aquifers are not hydraulically interconnected. Groundwater flow direction could not be determined during the hydrogeologic investigation due to the limited number of wells installed; however, it is reasonable to assume that flow direction follows the slope of the underlying aquitard topography and surface topography. As such, groundwater flow direction, in the alluvial aquifer, is assumed to be to the west-southwest.

The alluvial aquifer system (uppermost aquifer) is overlain by an upper till unit. The thickness of the upper till unit ranged from five to eight feet. Although all soil borings completed to date at the site indicate the upper till unit is continuous across the site, based on the till thickness and the depth of the building foundation there is a potential that the upper till unit has been penetrated by the building foundation.

The hydrogeologic and geologic conditions encountered during the hydrogeologic investigation are discussed in more detail in Attachment E-1.

E-1c IDENTIFICATION OF AQUIFERS UTILIZED  
[Rule 299.9506(1)(c) and (f)]

A well survey was conducted by the MDNR Geological Survey Division for a minimum 1-mile radius around the Site. The well survey area is presented in Attachment E-1. Copies of the water well records within the 1-mile radius are also presented in Attachment E-1. There are no known wells within 2,000 feet of the facility.

E-1d OTHER AQUIFERS [Rule 299.9506(d)]

As discussed in Section J-2, in the west-central region of Michigan, water supply for rural, industrial and domestic consumption comes from both surface and groundwater sources. In close proximity to Lake Michigan, the main source of water comes from the lake. Further inland however, many communities and industries depend on the use of groundwater and only a small number of inland communities use surface water as a source. Table E-1 describes the source of water for various communities within Kent County.

Within the west-central region of Michigan, Kent County is one of the major users of groundwater. State wide, Kent County ranks third in the number of wells with a total of 11,511 registered installations (based on 1981 data). This figure accounts for 5.3 percent of all the water wells within the State of Michigan. Cascade Township which is located southeast of the City of Grand Rapids has the highest density of wells at 31 wells per square mile (1,135 wells in total).

The water supply wells in Kent County draw water from a number of geologic formations. One of the best producing formations is the overburden unit. The overburden unit is composed of sands, gravels and silts which are typical glacial outwash features. Table E-2 summarizes a limited data set for some of the water wells within Kent County. Many of the wells which are located in the glacial drift are capable of producing substantial quantities of water. The material properties allow for the high transmissivities values which are reported for this formation. Transmissivity values as high as 100,000 gpd/ft have been reported. The

TABLE E-1

SOURCE OF MAJOR COMMUNITY WATER  
SUPPLIES IN KENT COUNTY

<i>Community</i>	<i>SOURCE</i>					
	<i>Drift Aquifers</i>	<i>Bedrock Wells</i>	<i>Drift &amp; Bedrock Wells</i>	<i>Surface Water</i>	<i>Purchased</i>	<i>Unspecified</i>
Grand Rapids				X		
Wyoming				X		
Kentwood					X	
Walker					X	
East Grand Rapids					X	
Grandville					X	
Lowell			X			
Rockford				X		
Cedar Springs	X					
Others	10	1	1	0	4	1
Total # of Supplies	11	1	2	3	8	1

NOTES:

- \* Indicates the presence of standby wells.  
Source: USEPA, 1981.

TABLE E-2

HYDRAULIC CHARACTERISTICS OF  
WATER WELLS IN KENT COUNTY

LOCATION	#OF WELLS	DEPTH (FT.)	WELL CAPACITY	FORMATION
Adatowne	3		88-120	Glacial drift
Cedar Springs	2	47-90	715-1016	Glacial drift
Lowell	3			Glacial drift
	2	103-108	108-946	Glacial drift
	2	47-71	120-800	Glacial drift
	1	107	800	Saginow
Rockford	1	20	100	Glacial drift
Sparta	3		300-500	Glacial drift
	1	88	490	Glacial drift
	1	280	250	Bayport
Maracaibo Shares	1	235		Coldwater
Alpine Twp	1	137	291	Glacial drift
Algona Twp.	1	377	50	Bayport
Bowne Twp.	1	47	199	Glacial drift
Byron Twp.	1	60	5	Glacial drift
	3	132-215	30-325	Marshall
Byron Center	1	271	180-200	Marshall
Canon Twp.	1	152	970	Glacial drift
	2	65-151	12-25*	Glacial drift
Cascade Twp.	1	106	322	Glacial drift
	1	180	465	Glacial drift
	3	50-159	60-239	Glacial drift
	1	212	10*	Marshall
Courtland Twp.	1	132	400	Glacial drift
Gaines Twp.	1	230	45*	Marshall
Grand Rapids Twp.	2	100-230	700-400	Glacial drift
Delson Twp.	1	41	2*	Glacial drift
Oakfied Twp.	1	300	1200	Glacial drift
Paris Twp.	4	262-325	30-500	Marshall
Plainfield Twp.	1	98	910	Glacial drift
	1	137	350	Glacial drift
	3	212-252	500-1180	Bayport
Sparta Twp.	1	68	243	Glacial drift
	1	280	250	Bayport
Walker Twp.	2	50-120	240-500	Glacial drift
	1		320	Glacial drift
	1	212	500	Bayport
	1	245	35	Michigan
	2	322-340	200-350	Marshall
Wayland Twp.	1		175	Michigan
Wyoming Twp.	1	73	1000	Glacial drift
	1	202	602	Marshall

Notes:

- \* Indicates flowing well.  
Source: USEPA, 1981

TABLE E-3

WATER QUALITY SUMMARY OF COMMUNITY  
WATER SYSTEMS DEVELOPED IN THE GLACIAL  
DRIFT AQUIFER IN KENT COUNTY

<i>Parameter</i>	<i>EPA Maximum Contaminant Level</i>	<i>Range</i>	<i>Mean</i>	<i>Standard Deviation</i>
Nitrate	10.0 mg/L	0.0 - 3.1	0.6	0.9
Fluoride	3.40 mg/L	0.00 - 0.90	0.24	0.22
Chloride	250 mg/L	1 - 85	10	17
Iron	0.30 mg/L	0.00 - 2.10	0.40	0.45
Sulfate	250 mg/L	0 - 200	46	37
Total Dissolved Solids	500 mg/L	206 - 509	14	66
Specific Conductance	850 umhos	300 - 755	494	106

Notes:

Water Analyses from Drift Aquifer based on:

Number of water systems - 12

Number of wells sampled - 26

Number of samples analyzed - 41

- source: USEPA, 1981

water quality from the overburden is also quite good as seen in Table E-3 which represents the water quality of 12 different community water systems developed in the glacial drift aquifer. Table E-3 indicates that nitrate, fluoride, chloride and sulfate concentrations are below the USEPA drinking water standards. Iron and TDS do on occasion exceed the environmental guidelines.

Beneath the above-mentioned glacial drift overburden, lies a sequence of important bedrock formations which are also used as a source of water within Kent County. All of the various bedrock formations are detailed subsequently in this section. As shown in Table E-2, from a limited number of wells, it is obvious that the various formations are good sources for abundant water. The water quality of three sampled community systems as shown in Table E-4, indicates that the concentrations of nitrate, fluoride, chloride and sulfate are all below acceptable drinking water standards. On occasion, TDS and iron concentrations exceed the environmental guidelines.

### Pennsylvania Period

#### Saginaw Formation

The shallowest bedrock formation, the Saginaw, is an important aquifer in much of the central and eastern parts of the Lower Peninsula. This formation is characterized as being primarily sandstone and siltstone with interbedded layers of shale, limestone, coal and gypsum. Naturally with these materials, there exists a wide range of porosities for this unit. The lenticular shaly sandstones tend to have a low effective porosity whereas the clean sandstone bodies have a much higher effective porosity. As a water supply aquifer, the Saginaw formation has a very good yield mainly in the upper portions of the unit. The transmissivity of the Saginaw is greater in the upper portions of the unit primarily due to increased fracturing at the bedrock surface. Transmissivities range anywhere from 9,520 gpd/ft to 37,156 gpd/ft.

### Mississippian Period

#### Bayport Limestone

The Bayport conformably overlies the Michigan Formation. Upon deposition, the Bayport was dissected by erosional processes before deposition of the Saginaw Formation had taken place. In the upper portions of this unit,



TABLE E-4

WATER QUALITY SUMMARY OF COMMUNITY WATER SYSTEMS  
DEVELOPED IN BEDROCK FORMATIONS IN KENT COUNTY

<i>Parameter</i>	<i>EPA Maximum Contaminant Level</i>	<i>Saginow Formation Range</i>	<i>Mean</i>	<i>Bayport Formation Range</i>	<i>Mean</i>
Nitrate	10 mg/L	0.0 - 0.0	0.0	0.0 - 0.0	0.0
Fluoride	2.4 mg/L	0.00 - 0.21	0.15	0.30 - 0.32	0.31
Chloride	250 mg/L	1 - 14	7	4 - 6	5
Iron	0.30 mg/L	0.00 - 2.70	1.11	0.10 - 1.32	0.71
Sulfate	250 mg/L	70 - 172	134	41 - 59	50
Total Dissolved Solids	500 mg/L	350 - 523	442	370 - 353	332
Specific Conductance	850 umhos	600 - 748	671	535	535

Notes:

Water Analyses from Saginow Formation based on:

- Number of water systems - 2
- Number of wells sampled - 3
- Number of samples analyzed - 5

Water Analyses from Bayport Limestone based on:

- Number of water systems - 1
- Number of wells sampled - 2
- Number of samples analyzed - 2

- source: USEPA, 1981

dolomite and limestone are the main materials. At deeper elevations however, the limestone becomes more shaly in nature and more fossiliferous. The basal portion of this unit is generally quite dense, cherty, combined with interbeds of quartz sandstone and anhydritic dolomite. Due to the non-porous nature of some of the carbonate units, this formation is not viable as an aquifer within Kent County. Alternatively, due to the presence of some sandstone beds within the unit, the effectiveness of this formation as a confining unit is also questionable.

#### Michigan Formation

This formation can be characterized by a sequence of dark gray shales, limestone dolomite, sandstone, gypsum and anhydrite. Although this unit is used as a water bearing unit for small quantities of water, it is not regarded as a good aquifer. The small isolated sandstone layers are capable of producing only small quantities of water whereas on the other hand, the shale, gypsum and anhydrite sub-units are very useful as confining layers. No transmissivity value is available for this formation.

#### Marshall Sandstone

The Marshall Sandstone is not only one of the most productive aquifers in the state, it is also the most utilized bedrock aquifer in Kent County. The formation is composed of siltstone to fine to medium-grained sandstone. The recharge to this unit is primarily through overlying glacial and lacustrine deposits toward the east. As an aquifer, this unit is capable of supplying great quantities of water to a number of wells which penetrate this formation. Water wells within this unit have reported capacities of 325, 500, 350 and 602 gpm in the respective townships of: Byron, Paris, Walker and Wyoming.

#### Coldwater Shale

The Coldwater Shale in southwest Michigan is gray, micaceous in texture, and approximately 500 feet in thickness. In general, this formation is not recognized as a good aquifer due to its low effective porosity. However, despite the poor classification as an aquifer, the Coldwater Shale is used as a water supply source in nearby Marcaibo Shores, Michigan. Locally at Marcaibo Shores, the transmissivity of the Coldwater Shale was documented as 26,700 gpd/ft.

Despite the wide occurrence of water wells within Kent County and the apparent suitability of groundwater resources, there are not any water wells within the vicinity of Gold Shield Solvents facility in Grand

Rapids, as was evidenced by the well survey conducted. As shown in Table E-1, the City of Grand Rapids draws its source of water from a surface source. The principal source of water which supplies the City comes from Lake Michigan. In 1982, Grand Rapids removed an average 38 Mgal/day ( $59 \text{ ft}^3/\text{s}$ ) from Lake Michigan and an additional 2 Mgal/day ( $3 \text{ ft}^3/\text{s}$ ) from the Grand River (Bedell 1982). These sources of water are also believed to supply nearby communities of Wyoming, Kentwood, Walker, East Grand Rapids and Grandville.

E-1e TOPOGRAPHIC MAP REQUIREMENTS  
[Rule 299.9506(1)(e)]

Rule 299.9506(1)(e) and 40 CFR§270.(c)(2) requires that several pieces of data be placed on a topographic map. To simplify conditions and to better highlight the information requested, Table E-5 presents a cross-reference list as to location of the information throughout this operating permit application.

E-1f CONTAMINANT PLUME DESCRIPTION  
[Rule 299.9506(g)]

As stated in Section E-1(a) no interim status groundwater monitoring was required for the hazardous waste container storage area.

TABLE E-5

## TOPOGRAPHIC MAP REQUIREMENTS

<i>ITEM</i>	<i>ATTACHMENT LOCATION</i>
Property Boundary	A-2, B-5, B-7, B-9, D-1a, E-2, F-1, F-4, G-1, G-2, G-3, I-1, K-1a, K-1b
Hazardous Waste Management Area	B-7, E-2, K-1a
Point of Compliance	B-7, E-2
Existing and Proposed Monitoring Wells	B-7, E-2

E-2 GROUNDWATER MONITORING PROGRAM  
[Rule 299.9611(2)(a), 299.9612]

E-2a GENERAL GROUNDWATER MONITORING  
REQUIREMENTS [40 CFR § 270.14(c)5, § 264.97]

The proposed detection monitoring program (40 CFR § 264.98), described in Subsection E-2b of this operating license application, satisfies the general groundwater monitoring requirements of 40 CFR § 264.97. The general groundwater monitoring requirements are discussed below.

E-2a(1) DESCRIPTION OF WELLS [40 CFR § 264.97(a)]

As discussed previously in Subsection E-1 and in the hydrogeologic report presented as Attachment E-1, two monitoring wells (MW2, MW3) have been installed in the uppermost aquifer beneath the facility.

The two existing monitoring wells are located on the figure presented as Attachment E-2. As discussed in Section E-1b and Attachment E-1, the groundwater flow direction, in the uppermost aquifer, is assumed to be to the west-southwest. Therefore, two additional monitoring wells (MW4 and MW5) are, proposed to be installed into the uppermost aquifer at the locations shown on the figure presented in Attachment E-2.

The proposed monitoring well system will, therefore, consist of one upgradient well (MW3) and three downgradient wells (MW2, MW4 and MW5) relative to the container storage area. It is to be noted, that well MW4 will be installed first. Immediately subsequent to installation, well MW4 will be developed and a full set of water levels from all upper aquifer most wells will be taken. The final location of well MW5 will be selected subsequent to interpreting the water level data, to ensure the well is installed downgradient to the container storage area such that all of the downgradient wells will be capable of yielding groundwater samples that represent groundwater passing the point of compliance in the uppermost aquifer.

E-2a(2) MONITORING WELL DESIGN [40 CFR § 264.97(c)]

As discussed in Section E-1b and Attachment E-1, the uppermost aquifer is overlain by an upper till unit. In order to ensure the

integrity of the wells, installed as part of the hydrogeologic investigation, the upper till unit was cased off using a 10-inch diameter outer PVC casing. The casing was set a minimum of two feet into the clay and grouted in place. The grout was allowed to set prior to advancing the borehole.

Stratigraphic and instrumentation logs for existing wells are presented in Attachment E-1. A typical uppermost aquifer monitoring well construction detail is presented as Attachment E-3. Proposed wells MW4 and MW5 will be installed and developed following the same procedures and materials utilized for wells MW2 and MW3, which are documented in Attachment E-1.

E-2a(3) SAMPLING AND ANALYSIS PROCEDURES  
[40 CFR § 264.97(d), (e) and (f)]

The requirements of this section are addressed in Attachment E-4. In addition to sampling and analysis procedure, Attachment E-4 also presents the protocol for conducting single well response tests, to determine the in situ horizontal hydraulic conductivity of the screened materials. Each well in the uppermost aquifer will be subjected to a single well response test.

In general, groundwater samples will be collected using dedicated, bottom-filing, stainless steel bailers. A minimum of three standing well volumes will be removed prior to sample collection. The groundwater surface elevation will be determined prior to purging each well.

Samples will be collected semi-annually, subsequent to establishing background groundwater quality, and analyzed for the hazardous waste constituents trichloroethylene, 1,1,1-trichloroethane, methylene chloride, tetrachloroethylene and trichlorotrifluoroethane. Section E-2b provides the rationale for selection of these parameters.

E-2a(4) PROCEDURES FOR ESTABLISHING BACKGROUND  
GROUNDWATER QUALITY 40 CFR§264.97(g)]

Five hazardous waste constituents have been selected to assess water quality: trichloroethylene; 1,1,1-trichloroethane; methylene chloride; tetrachloroethylene; and, trichlorotrifluoroethane.

Background groundwater quality for each hazardous waste constituent will be based on data from the quarterly sampling of upgradient monitoring well MW3 over a 1-year period. Four samples will be collected from the well during each sampling event. Prior to and between the collection of each of the four samples, the well will be allowed to recharge. The well will then be repurged prior to collection of the next sample. This procedure will reduce the correlation (lack of independence) between samples collected during the same sampling event. A total of sixteen groundwater samples will be generated during the first sampling year. A background mean and variance for the hazardous waste constituents will then be determined using the statistical procedure discussed in Section E-2b(5)(vii).

Four samples will be collected from upgradient well MW3 semi-annually after the first year of sampling. The background mean and variance will subsequently be revised semi-annually.

E-2a(5) PROPOSED POINT OF COMPLIANCE [40 CFR § 264.95(c)]

As discussed in Section E-2a(1), the groundwater flow direction in the uppermost aquifer is assumed to be to the west-southwest. Therefore, the horizontal extension of the proposed point of compliance will be along the west and southwest sides of the facility walls, as illustrated on Attachment E-2. The projection represents a vertical plane that extends downward into the uppermost aquifer underlying the site. The proposed point of compliance will be finalized subsequent to the installation of proposed monitoring wells MW4 and MW5 (see Section E-2a(1)).

E-2b DETECTION MONITORING PROGRAM [40 CFR § 264.98]

A detection monitoring program, pursuant to 40 CFR § 264.98 will be implemented at the Gold Shield Solvents, Grand Rapids facility. As discussed Section E-1, interim status groundwater monitoring was not required, therefore, the presence or absence of hazardous waste constituents in the groundwater in the uppermost aquifer has not been determined. This section presents the elements of the detection monitoring program to be implemented at the site.

Date: 06/19/89  
Revision: 89-1  
Page: E-14

E-2b(1) MONITORING PARAMETERS [40 CFR § 264.98(a)]

The following hazardous waste constituents will be analyzed for in the samples collected from the compliance point and upgradient monitoring wells:

1,1,1-Trichloroethane  
Trichloroethylene  
Methylene Chloride  
Tetrachloroethylene  
Trichlorotrifluoroethane

All five parameters on the list of proposed monitoring parameters are the specific hazardous waste constituents historically and currently handled and stored at the Gold Shield Solvents, Grand Rapids facility. These parameters will provide a reliable indication of the presence of hazardous constituents in the groundwater due to their good mobility and persistence in the groundwater environment.

E-2b(2) DETECTABILITY [40 CFR § 264.98(a)(3)]

Method detection limits for the hazardous waste constituent monitoring parameters are presented in the sampling and analysis plan presented in Attachment E-4.

E-2b(3) BACKGROUND CONCENTRATIONS AND  
COEFFICIENTS OF VARIANCE  
[40 CFR § 264.98(a)(4)]

Background concentrations and coefficients of variance for the detection monitoring parameters will be determined as discussed in Section E-2a(4) using the statistical procedure discussed in Section E-2b(5)(vii).

E-2b(4) DETECTION GROUNDWATER MONITORING  
SYSTEM [40 CFR § 264.98(b)]

The detection groundwater monitoring system will consist of one well upgradient to the container storage area and three downgradient monitoring wells at the point of compliance, as discussed in Section E-2a(1).



E-2b(5) SAMPLING, ANALYSIS AND STATISTICAL COMPARISON  
PROCEDURES [40 CFR § 264.98(c), (d), (e), (f)]

The following is a description of the sampling, analysis and statistical comparison procedures which will be used to provide a reliable indication of the presence of hazardous waste constituents in the groundwater passing the point of compliance in the uppermost aquifer.

E-2b(5)(i) SAMPLE COLLECTION

All samples will be collected in accordance with the protocols detailed in the sampling and analysis plan presented in Attachment E-4.

E-2b(5)(ii) SAMPLE PRESERVATION AND SHIPMENT

All samples shall be preserved and shipped in accordance with the protocols detailed in the sampling and analysis plan presented in Attachment E-4.

E-2b(5)(iii) ANALYTICAL PROCEDURES

All samples will be analyzed for the hazardous waste constituent monitoring parameters in accordance with SW846<sup>1</sup>, Method 8240, 3rd Edition. Table 2 presented in Attachment E-4, lists the appropriate methods and method detection limits for each of the parameters.

E-2b(5)(iv) CHAIN-OF-CUSTODY

Chain-of-custody records will be used to track all samples from the time of sample collection through analysis. Chain-of-custody procedures are discussed in Attachment E-4.

---

<sup>1</sup> SW846 Test Methods for Evaluation Solid Waste Physical/Chemical Methods, 3rd Edition, Sept. 1986.

E-2b(5)(v) ADDITIONAL REQUIREMENTS FOR COMPLIANCE  
POINT MONITORING

The three compliance point monitoring wells, described in Section E-2a(1), will be sampled semi-annually, as discussed in Section E-2a(3), and analyzed for the hazardous waste constituent monitoring parameters presented in Section E-2b(1). The measured concentrations of the monitoring parameters will be summarized in tabular form and expressed in ug/L. A statistical comparison will be performed for each semi-annual sampling round. Statistical analysis comparison will be completed within 14 days of receipt of validated laboratory data reports.

Compliance point monitoring will commence simultaneously with the last quarterly event for determining background concentrations.

E-2b(5)(vi) ANNUAL DETERMINATION

The direction and rate of groundwater flow shall be determined annually in the uppermost aquifer. Potentiometric maps shall be prepared for each of the preceding sampling periods. These maps will be used to define groundwater flow direction and hydraulic gradient. The groundwater flow rate shall be calculated using the following equation:

$$V = \frac{Ki}{n}$$

Where: V = groundwater flow rate  
K = hydraulic conductivity in the uppermost aquifer  
i = hydraulic gradient in the uppermost aquifer  
n = porosity

The hydraulic conductivity in the uppermost aquifer will be defined subsequent to the installation of proposed monitoring well MW4 and MW5 (see Section E-2a(1)). The porosity of the upper aquifer materials, based on grain-size data is estimated at 30 percent.

Date: 06/19/89  
Revision: 89-1  
Page: E-17

E-2b(5)(vii) STATISTICAL DETERMINATION COMPARISON  
PROCEDURE

The concentrations of 1,1,1-Trichloroethane, Trichloroethylene, Methylene Chloride, Tetrachloroethylene and Trichlorotrifluoromethane in each compliance point monitoring well will be statistically compared to the background data from the upgradient monitoring well. The background data which will be used is described in Section E-2a(4), and the statistical procedure which will be used is described below.

Within 14 days of receipt of validated laboratory data reports from each sampling event, the arithmetic mean and variance on each sample for each well will be calculated and compared to the background arithmetic mean. The comparison will consider individually each of the wells in the monitoring system and will use the statistical testing procedure, as described in Attachment E-5, to determine statistically significant increase over initial background at the 0.01 level of significance.

If the comparison indicates that the difference is significant for one or more downgradient wells, then that well will be sampled three times within thirty days. These additional groundwater samples will be analyzed for the detected parameter to determine whether the significant difference is due to sampling or laboratory error. If the monitoring parameter is not detected in any of the three new samples, then the original detection of this parameter will be attributed to contamination during sampling or analysis. If the monitoring parameter is detected in at least one of the new samples, then the three new analyses will be combined with the original analysis to form a background data set with a size of four. This will be statistically compared to the background data set. If the comparison confirms that the concentration increase is significant, Detrex will respond in compliance with 40 CFR § 264.98(h).

Date: 06/19/89  
Revision: 89-1  
Page: E-18

**E-3    ANNUAL SOIL MONITORING PROGRAM WAIVER**

Detrex Corporation requests a waiver from the Director, pursuant to Rule 299.9611(4) for the requirement under Rule 299.9611(2)(c) for an annual soil monitoring program.

The hazardous waste container storage area, for which the operating license is being applied for, is located inside a totally enclosed building. All loading/unloading operations are also conducted internal to the building.

Date: 06/19/89  
Revision: 89-1  
Page: E-19

E-4 AIR MONITORING

Detrex Corporation requests a waiver from the Director, pursuant to Rule 299.9611(4) for the requirement under Rule 299.9611(2)(b) for an ambient air monitoring program.

All drums that are stored in the container storage area remain tightly sealed during storage. While in the container storage area the drums are opened only to collect a sample of the waste material for analysis. As such, ambient air monitoring associated with the container storage area is not necessary.